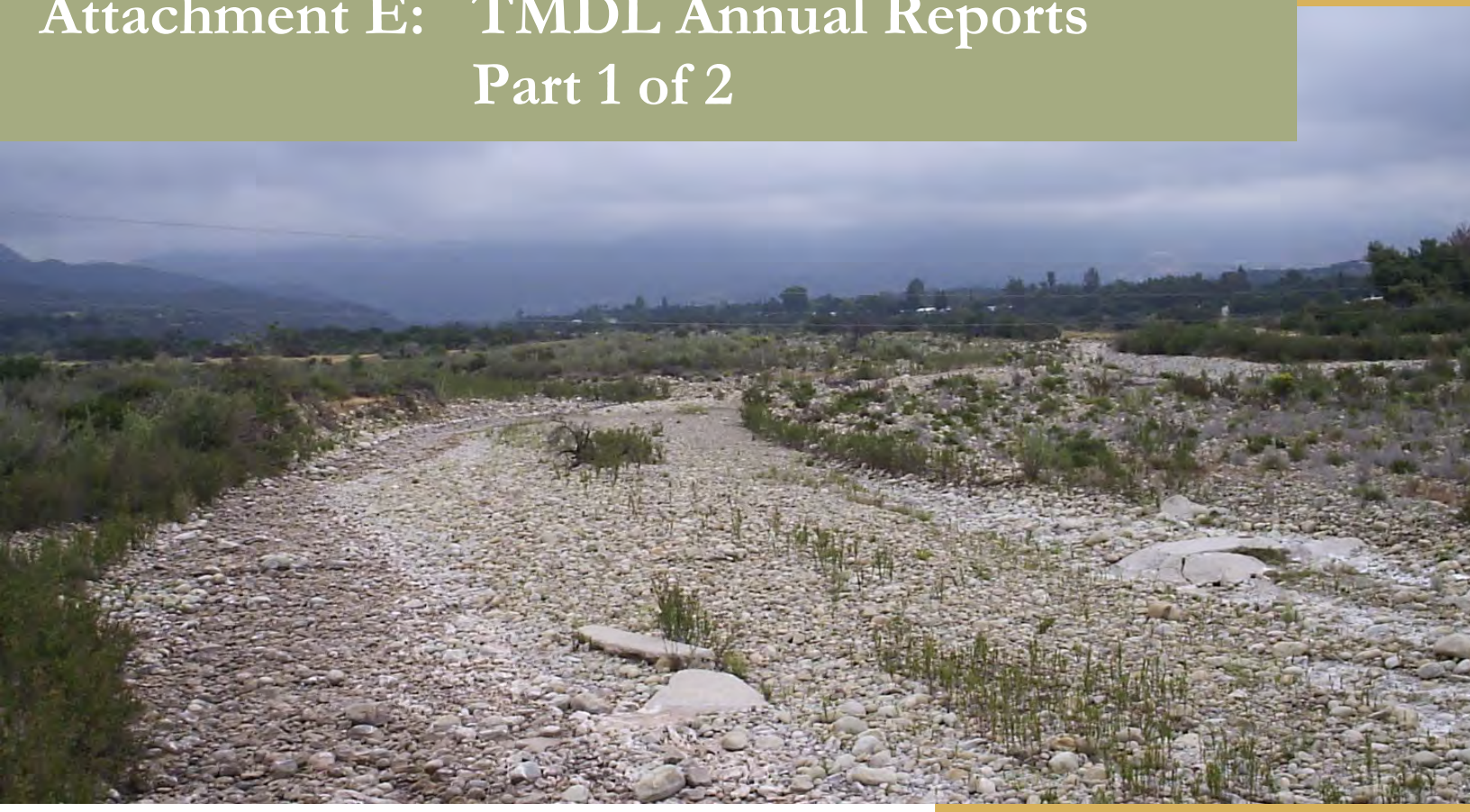
Ventura Countywide Stormwater Quality Management Program

2013-2014 Permit Year

Ventura Countywide Stormwater Quality Management Program Annual Report

Attachment E: TMDL Annual Reports Part 1 of 2



December 12, 2014

Camarillo
County of Ventura
Fillmore
Moorpark
Ojai
Oxnard
Port Hueneme
Santa Paula
Simi Valley
Thousand Oaks
Ventura
Ventura County Watershed Protection District

Attachment E: Total Maximum Daily Load Data and Reports Part 1 of 2

Revlon Slough and Beardsley Wash Trash TMDL
City of Oxnard 2013 Annual Report

Ventura River Estuary
2012-2013 Trash TMDL TMRP/MFAC Annual Report

Calleguas Creek Watershed TMDL
Compliance Monitoring Program
Sixth Year Annual Monitoring Report

Malibu Creek Watershed Trash TMDL
TMRP/MFAC Second Annual Report

2013 Annual Report

City of Oxnard Public Works Department

Revlon Slough and Beardsley Wash Trash TMDL
Regional Board Resolution No. R4-2007-007

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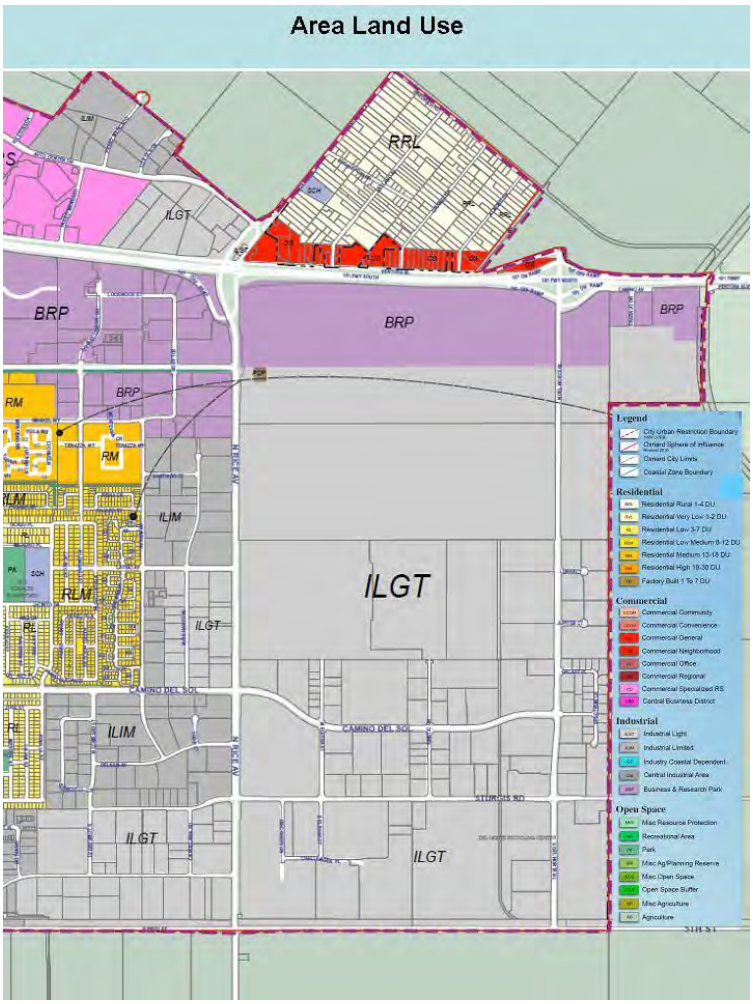
Section 1
Introduction

1.1 Environmental Setting

The City of Oxnard is the largest city in Ventura County, with a population of approximately 200,000. The City occupies the western edge of the Oxnard Plain, a flat, fertile land noted for its agricultural produce. Many large open-channel conveyances transport stormwater and urban runoff to major waterbodies, including three that discharge to the Beardsley Wash / Revolon Slough branch of the Calleguas Creek Watershed. These three channels, the Nyeland Drain, Sturgis Drain, and 5th Street Drain, are listed as impaired for trash, and are subject to the Calleguas Creek Trash Total Maximum Daily Load (TMDL).

Calleguas Creek and its tributaries, including Revolon Slough and Beardsley Wash, are located in southeast Ventura County. Calleguas Creek drains an area of approximately 343 square miles from the Santa Susana Mountains to the Pacific Ocean. Water within the Calleguas Creek watershed travels 30 miles from the surrounding mountains through the Mugu Lagoon and empties into the Pacific Ocean. Revolon Slough starts as Beardsley Wash in the Camarillo Hills, and continues into Pleasant Valley, and then into the Oxnard Plain, where it is known as Revolon Slough. The Slough is concrete-lined just upstream of Central Avenue and remains lined with rip-rapped sides. The lower mile to mile and a half of the Slough to above Las Poses Road appears to be tidally influenced. The primary water sources for Beardsley Wash and Revolon Slough are agricultural and storm water.

The land uses in the area of the three channels are predominately light industry within Oxnard city limits, and agricultural outside of the city limits.



The purpose of this document is to provide an analysis of the impacts of trash from these land uses in the monitored channels flowing to Beardsley Wash / Revolon Slough, and to recommend management measures to address the impacts.

1.2 Baseline Trash and Percent Reduction

The first monitoring event in each channel exhibited "normal" trash accumulation, based on past annual monitoring performed under City Corps' Storm Drain Keeper Program. Additionally, trash accumulation drop-off rates were fairly consistent among the three channels. It can, therefore, be assumed that the first monitoring event is a representative baseline trash level against which future efforts and full capture devices can be compared for effectiveness. The following baseline trash quantities, by channel, were submitted to the Regional Board in the 2010 Annual Report:

Monitored Channel	Baseline Number of Pieces
Nyeland Drain	120
Sturgis Drain	105
5th Street Drain	174

Section 5.5 will discuss the results of monitoring compared to these baseline numbers.

1.3 Municipal Stormwater Program

The City of Oxnard is a co-permittee to the Ventura Countywide Municipal Stormwater Program's National Pollutant Discharge Elimination System (NPDES) permit. This permit requires the development and implementation of a stormwater management program that reduces pollutants carried in urban runoff to the maximum extent practicable (MEP). While MEP is not defined by the regulatory agencies, it generally means the application of best management practices (BMPs) that achieve a balance between effective reductions of a pollutant of concern and economic achievability. One of the potential pollutants of concern to any stormwater program is trash. BMPs to address trash consist of traditional source control (education, street sweeping, and catch basin cleaning) and treatment control (e.g., trash grates and CDS devices). Many of the requirements of the municipal stormwater permit have led to a decrease in trash from baseline levels.

The requirements of the latest NPDES stormwater permit are:

5. Storm Drain Operation and Management

(a) Catch Basin Cleaning

(1) Each Permittee shall designate catch basin inlets within its jurisdiction as one of the following:

Priority A: Catch basins that are designated as consistently generating the highest volumes of trash.

Priority B: Catch basins that are designated as consistently generating moderate volumes of trash.

Priority C: Catch basins that are designated as generating low volumes of trash.

Within one year of Order adoption (May 7, 2010), Permittees shall submit a map or list of Catch Basins with their GPS coordinates and their designations. The map or list shall contain the rationale or data to support designations.

(2) Each Permittee shall inspect catch basins according to the following schedule:

Priority A: A minimum of 3 times during the wet season and once during the dry season every year.

Priority B: A minimum of once during the wet season and once during the dry season every year.

Priority C: A minimum of once per year.

Catch basins shall be cleaned as necessary on the basis of inspections.

Permittees shall maintain inspection records for Regional Board review.

(3) In addition to the preceding schedule, Permittees shall ensure that any catch basin that is determined to be at least 25% full of trash shall be cleaned out.

(b) Trash Management at Public Events

(1) Each Permittee shall require for any event in the public right of way or wherever it is foreseeable that substantial quantities of trash and litter may be generated, the following measures:

(A) Proper management of trash and litter generated; and

(B) Arrangement for temporary screens to be placed on catch basins; or

(C) Provide clean out of catch basins, trash receptacles, and grounds in the event area within 24 hours subsequent to the event.

(c) Trash Receptacles

(1) Each Permittee shall install trash receptacles, or equivalent trash capturing devices in areas subject to high trash generation within its jurisdiction no later than May 7, 2010.

(2) Each Permittee shall ensure that all trash receptacles are cleaned out and maintained as necessary to prevent trash overflow.

(d) Catch Basin Labels

(1) Each Permittee shall inspect the legibility of the catch basin stencil or label nearest each catch basin and inlet before the wet season begins.

(2) Each Permittee shall record and re-stencil or re-label within 15 days of inspection, catch basins with illegible stencils.

(e) Additional Trash Management Practices

(1) Each Permittee shall install trash excluders, or equivalent devices on or in catch basins or outfalls to prevent the discharge of trash to the storm drain system or receiving water no later than two years after Order adoption date in areas defined as Priority A (subpart 5(a)(1)) except in sites where the application of such BMP(s) alone will cause flooding. Lack of maintenance that causes flooding is not an acceptable exception to the requirement to install BMPs. Alternatively the Permittee may implement alternative or enhanced BMPs beyond the provisions of this permit (such as but not limited to increased street sweeping, adding trash cans near trash generation sites, prompt enforcement of trash accumulation, increased trash collection on public property, increased litter prevention messages or trash nets within the MS4) that provide substantially equivalent removal of trash. Permittees shall demonstrate that BMPs, which substituted for trash excluders provide equivalent trash removal performance as excluders. When outfall trash capture is provided, revision of the schedule for inspection and cleanout of catch basins in task 5.(a)(2) may be proposed by the Permittee for approval by the Executive Officer.

(f) Storm Drain Maintenance

(1) Each Permittee shall implement a program for Storm Drain Maintenance no later than November 3, 2009 that includes the following:

(A) Visual monitoring of Permittee-owned open channels and other drainage structures for debris at least annually.

(B) Remove trash and debris from open channel storm drains a minimum of once per year before the wet season.

(C) Eliminate the discharge of contaminants during MS4 maintenance and clean outs.

(D) Quantify the amount of materials removed using techniques appropriate for quantifying solid waste and ensure the materials are properly disposed of.

(h) Permittee Owned Treatment Control BMPs

(1) Each Permittee shall implement an inspection and maintenance program for all Permittee owned treatment control BMPs, including post-construction treatment control BMPs.

(2) Each Permittee shall ensure proper operation of all treatment control BMPs and maintain them as necessary for proper operation, including all postconstruction treatment control BMPs.

(3) Any residual water produced by a treatment control BMP and not being internal to the BMP performance when being maintained shall be:

(A) Hauled away and legally disposed of; or

(B) Applied to the land without runoff; or

(C) Discharged to the sanitary sewer system (with permits of authorization); or

(D) Treated or filtered to remove bacteria, sediments, nutrients, and meet the limitations set in Table 11 (Discharge Limitations for Dewatering Treatment BMPs) prior to discharge to the MS4.

6. Streets and Roads Maintenance

(a) Maintenance

(1) Each Permittee shall perform street sweeping of curbed streets in commercial areas and areas subject to high trash generation to control trash and debris at least two times per month.

These requirements are implemented by a variety of departments within the City of Oxnard, as described below:

Ventura County NPDES Compliance Activities
Drainage Facilities Maintenance
As Co-permittees to an NPDES stormwater permit, the City of Oxnard conducts routine cleaning of drainage facilities. Inspections are conducted at least once per year prior to the wet-weather season, beginning October 1. The inspections include visual observations of catch basins and open channels for accumulated trash and debris. Accumulated material is routinely removed from facilities to prevent trash and debris discharges and to maintain hydraulic capacity. Catch basin cleaning is conducted on an as-needed basis to keep trash and debris levels below 40% of catch basin capacity.

Roadway Maintenance
The Annual Report summarizes Co-permittee street sweeping activities. Streets in residential areas are reportedly swept at least six times per year. These practices do not specifically address the maintenance and cleaning activities in the vicinity of the Drains. However, cleaning activities are conducted in areas immediately adjacent to and tributary to the Drains.

Public Education & Outreach Programs
The VCWPD and the City of Oxnard participate in countywide efforts that are a combination of educational outreach and activities aimed to increase knowledge of stormwater pollution impacts and methods to reduce pollutant problems. The programs aim to change behaviors through activities and programs such as community outreach, storm drain inlet stenciling, and prohibition postings at access points to drainage channels.

Examples of community outreach efforts by Co-Permittees include:

- Coastal Cleanup Day - This program has enjoyed widespread public, multi-city and multi-agency involvement. This program provides volunteers an opportunity to clean local beaches and inland waterways. The most recent event occurred in September 2013. Over 2,800 volunteers cleaned 14 beaches and 5 inland waterway sites. Over 8,400 pounds of trash and 1,300 pounds of recyclables were collected.
- Presentations at schools, community groups, and public events
- Newspaper articles and advertisements
- Television and radio announcements
- Brochures
- Stormwater websites

1.4 Oxnard City Corps Stormdrain Keeper Program

The Oxnard City Corps (City Corps) has been operating in VCWPD drainage channels since April 2002, as part of the Oxnard City Corps Stormdrain Keeper Program. City Corps' storm drain cleaning program was jointly funded by the City of Oxnard and the VCWPD for the first year, and subsequently funded by City of Oxnard since. Besides the cleaning effort in the drainage channels, City Corps also has a street sweeping contract with the City of Oxnard, operating sweepers in downtown Oxnard twice per day.

City Corps' inspection and cleaning activities are coordinated through the VCWPD. A seven-member crew currently inspects and cleans the Wooley, J Street, Oxnard Industrial, and Oxnard West Drains three times per week.

City Corps staff members are highly motivated, and have been involved in discussing options and solutions for reducing trash and debris within the drains. City Corps has discussed treatment control devices with the City of Oxnard to control trash and debris.

1.5 Calleguas Creek Watershed Trash TMDL

Beardsley Wash and Revolon Slough were listed as impaired waterbodies based on the narrative water quality objective in the Basin Plan for floating material:

> *"Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses";*

and for solid, suspended, or settleable materials:

> *"Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses."*

By Regional Board Resolution No. R4-2007-007, the Basin Plan was modified to incorporate a Total Maximum Daily Load for Trash in Revolon Slough and Beardsley Wash. The numeric target for the Revolon Slough and Beardsley Wash TMDL is 0 (zero) trash within Revolon Slough, Beardsley Wash and their tributaries. Regional Board staff did not find information to justify any value other than zero that would fully support the designated beneficial uses. Further, court rulings have found that a numeric target of zero trash is legally valid. The numeric target was used to calculate the Load Allocations for nonpoint sources and Waste Load Allocations for point sources. The Effective Date of the Trash TMDL is March 6, 2008.

1.5.1 TMDL Implementation Schedule

*1.5.1.*1 Trash Monitoring Plan

The Basin Plan Amendment for the incorporation of the Trash TMDL included the following requirements for the preparation and implementation of a trash monitoring program for point source discharges, which are now incorporated into the Ventura County Municipal Stormwater permit:

Task No.	Task	Responsible Jurisdiction	Date
1	Submit Trash Monitoring and Reporting Plan, including a plan for defining the trash baseline WLA and a proposed definition of "major rain event".	City of Camarillo; City of Oxnard; Ventura County Watershed Protection District; Ventura County; Caltrans; Local land owners with conveyances	6 months from effective date of TMDL. If a plan is not approved by the Executive Officer within 9 months, the Executive Officer will establish an appropriate monitoring plan.
2	Implement Trash Monitoring and Reporting Plan.	City of Camarillo; City of Oxnard; Ventura County Watershed Protection District; Ventura County; Caltrans; Local land owners with conveyances	6 months from receipt of letter of approval from Regional Board Executive Officer, or the date a plan is established by the Executive Officer.
3	Submit results of Trash Monitoring and Reporting Plan, recommend trash baseline WLA, and propose prioritization of Full Capture System installation or implementation of other measures to attain the required trash reduction.	City of Camarillo; City of Oxnard; Ventura County Watershed Protection District; Ventura County; Caltrans; Local land owners with conveyances	2 years from receipt of letter of approval for the Trash Monitoring and Reporting Plan from Regional Board Executive Officer.

The City of Oxnard submitted its Trash Management and Monitoring Program to lay out the City's program for removing and evaluating trash downstream of proposed full-capture devices in the three channels flowing to Revolon Slough and Beardsley Wash (see Chapter 3.0).

On April 29, 2010, the City provided the first progress report on the implementation of the Trash Management and Monitoring Program. This annual report is submitted in compliance with Task No. 3 above, and proposes Wasteload Allocation baseline levels of trash in the three channels being monitored.

1.5.1.2 Trash Management Plan

The City of Oxnard proposed to install three FreshCreek devices, similar to the device installed in the Oxnard West Drain, in the channels flowing to the Calleguas Creek Watershed. The proposed devices are intended to capture the city's potential contribution of trash at the city limits.

City staff have since met with Regional Board staff to discuss the Trash Management Plan, in light of the data available to date under the Monitoring Program. The data indicate that the majority of the waste removed from the channels are deposited by wind transport instead of the expected transport through the City's storm drain system. Additionally, the intensive permit requirements for catch basin and open channel maintenance, combined with the TMDL Monitoring Program, have resulted in most of the trash removed before given the opportunity to be transported to receiving waters via MS4. We therefore proposed to Regional Board staff that the best full-capture strategy may be catch basin inserts for the sub-drainage basins . We initially thought that funding would come from the City's Measure O, which passed in 2009, and is a ½ cent sales tax increase; however, the Citizen Oversight Committee did not elect to fund this project. City staff are currently reviewing different options to fund this project.

1.5.1.3 MFAC

The City of Oxnard is also listed under the TMDL for non-point source contributions of trash to Revolon Slough and Beardsley Wash. As there are no non-point sources owned by the City, we have no facilities for which we can apply for a conditional waiver; however, we believe the requirements for an MFAC (below) are met by our current monitoring program.

3	Implement MFAC/BMP Program.	City of Camarillo; City of Oxnard; Ventura County; Agricultural dischargers; Ventura County Watershed Protection District; Caltrans; Local land owners with conveyances	Six months from receipt of Notice of Acceptance from Regional Board Executive Officer.
4	Submit annual TMRP reports including proposal for revising MFAC/BMP for Executive Officer approval.	City of Camarillo; City of Oxnard; Ventura County; Agricultural dischargers; Ventura County Watershed Protection District; Caltrans; Local land owners with conveyances	Two years from effective date of TMDL, and annually thereafter.

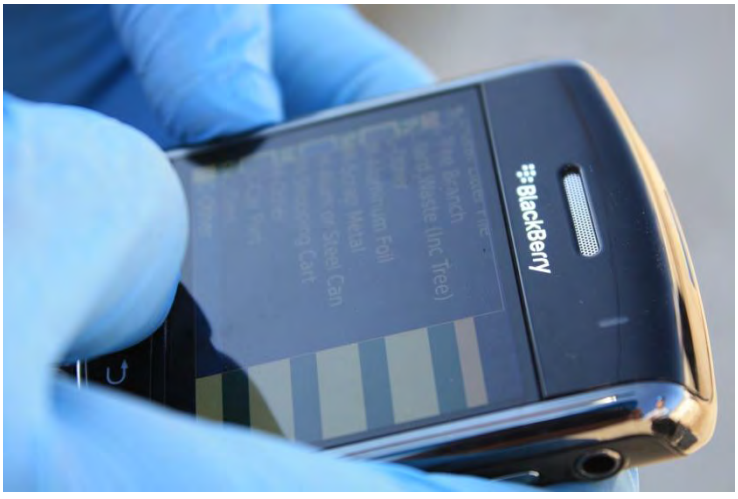
Section 2
City of Oxnard Trash Management and Monitoring Program

2.1 Trash Management

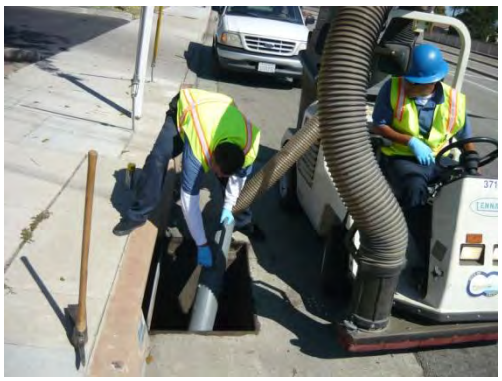
By letter dated September 3, 2008, the City of Oxnard transmitted its proposed Trash Management and Monitoring Program. The trash management measures proposed included the installation of FreshCreek Trash Netting full-capture system on three drains. The full-capture systems have been sized and designed, and were awaiting funding through the City's Measure O sales tax increase. As potential Measure O projects need approval by a Citizen Oversight Committee (http://www.cityofoxnard.org/uploads/measure_o_oversight_committee_agenda.pdf), City staff have proceeded with inclusion of purchase of one of the full capture devices under the Capital Improvement Project list. This Annual Report proposes a change to catch basin insert devices within the drainage areas that flow to Beardsley Wash/Revolon Slough. City staff are currently reviewing different options to fund this project. Enhanced existing BMPs (e.g., more frequent street sweeping and channel and catch basin maintenance), as well as the actual removal of litter during monitoring, continue to be proposed as interim BMPs until the full capture devices are installed.

2.2 Trash Monitoring

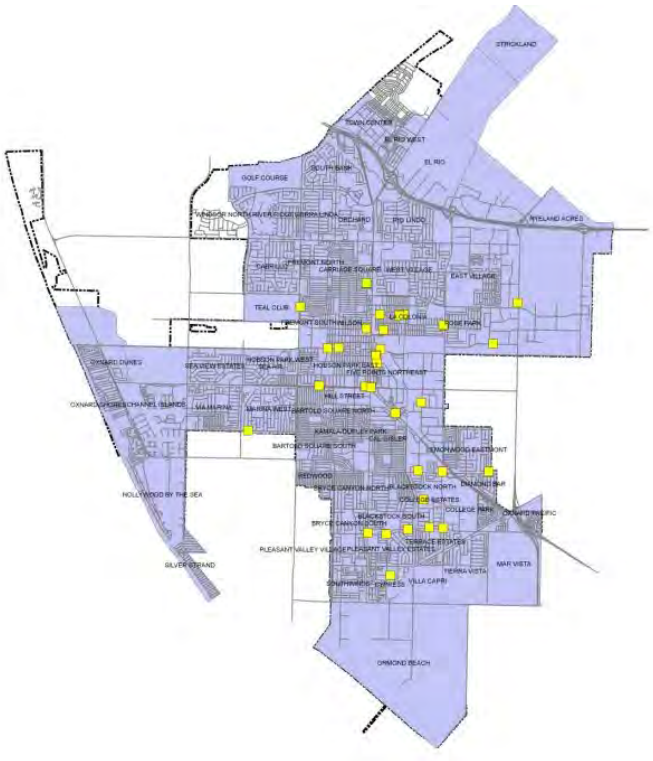
The Program proposed monitoring the three drains flowing to Revolon Slough / Beardsley Wash in a manner similar to the City Corps' Stormdrain Keeper Program. The CCWS monitoring would still utilize City Corps; however, instead of using manual data entry, City Corps crews were equipped with Blackberry Phones. The GPS-enable Blackberry phones and field checklist application were purchased by a grant supporting the use of new technology for municipal enterprise programs. The use of this technology is described in Section 3, Monitoring Methods.



These monitoring methodologies were moved upstream of the open channels this year when City Corps crews were engaged to perform the catch basin surveys and cleanings. Again, crews took GPS points for the catch basins, and a drop-down menu allowed them to quickly categorize percent trash, leaves, and sediment in the catch basin prior to maintenance.

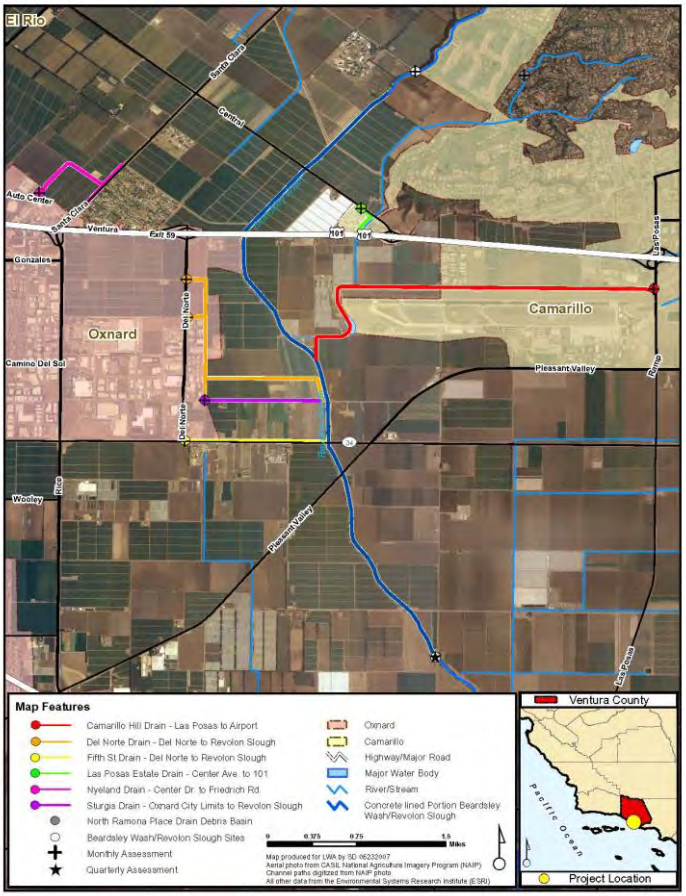


As shown on the map produced from the catch basin survey (below), there are no high priority catch basins (in yellow) within the Oxnard drainage areas tributary to Revolon Slough / Beardsley Wash.



Section 3
Monitoring Methods

Below is a map of the monitoring locations originally proposed by the stakeholders when considering TMDL implementation in the Beardsley Wash / Revolon Slough drains. The City of Oxnard proposed management measures and monitoring of the Nyeland Drain (pink), the Sturgis Drain (labeled Del Norte in the graphic and colored orange), and the 5th Street Drain (yellow).

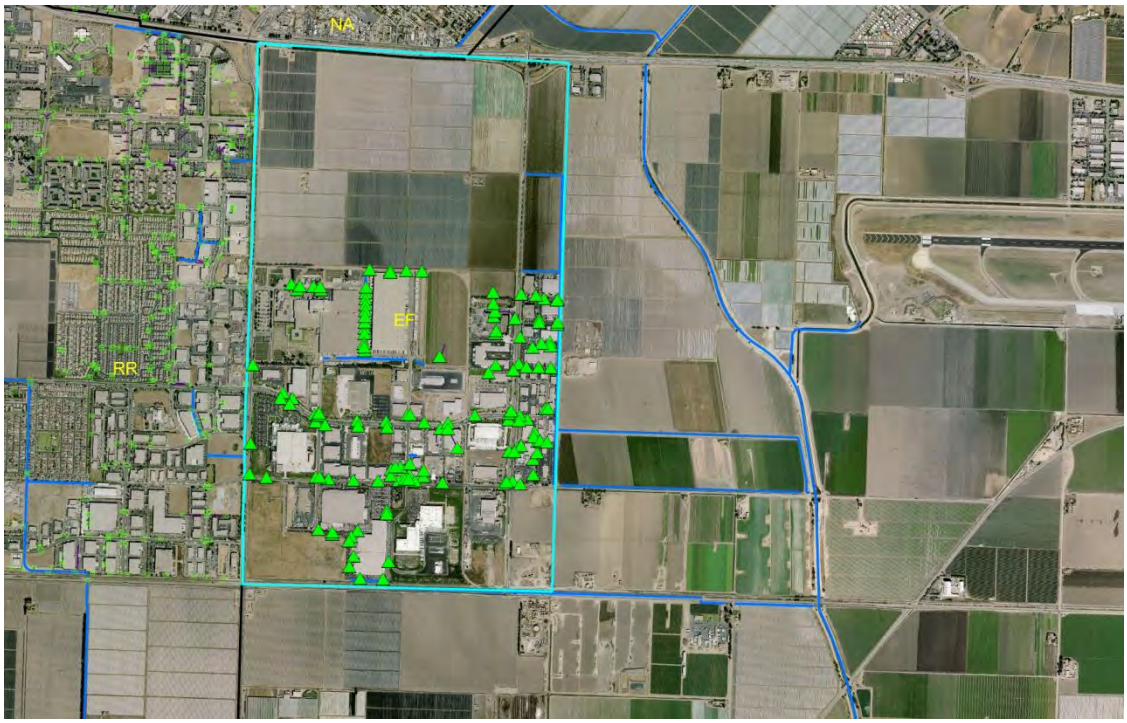


3.1 5th Street Drain

The 5th Street Drain, in the Project area, takes flows primarily from commercial and industrial areas of the City, including the Del Norte Recycling facility. These facilities installed various post-construction treatment devices when they were constructed, so many of the pollutants of concern have been eliminated. The open channel in the project area potentially receives runoff from 5th Street (State Highway 34), a Caltrans highway.

Downstream of the Oxnard city limit, other land uses include agriculture, oil and gas production, and state highway.

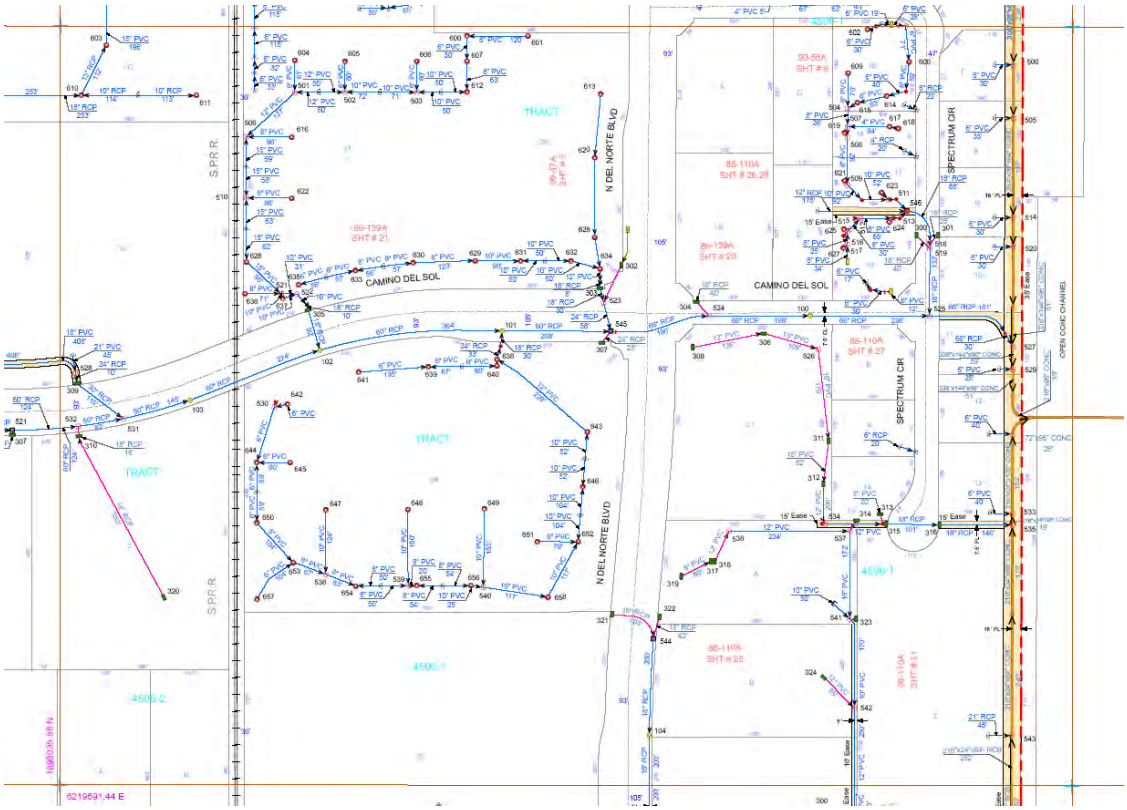
In the Trash Management and Monitoring Plan submitted by the City, a full-capture device is near the city limit; downstream of Oxnard MS4 input was proposed. Following discussions with Regional Board staff, an alternative full-capture strategy was suggested. City staff proposed that all of the catch basins that flow to the 5th Street and Sturgis drains (green triangles on the map below) are to receive catch basin inserts.



None of these catch basins are currently Priority A.

3.2 Sturgis Drain

Sturgis Drain receives mixed flows from commercial / industrial and agricultural areas. The drainage area is shown below:



None of these catch basins are currently Priority A.

The proposed FreshCreek device would have captured the joined north/south flows of the channel as they transition to the east, and to Revolon Slough. The sub-drainage area is now proposed for catch basin inserts (see Section 3.1 above).

3.3 Nyeland Drain

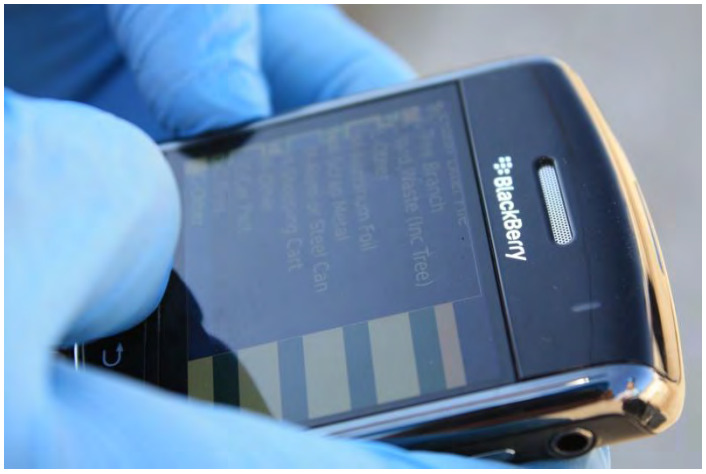
The Nyeland Drain receives commercial / industrial flows before entering agricultural drainage areas. The Nyeland drainage area is shown below:

The proposed FreshCreek device would have captured the joined north-bound flows as they daylight. Catch basin inserts are now proposed, as noted in the map above

None of these catch basins are currently Priority A.

3.4 Trash & Debris Characterization

City Corps crews are provided with GPS-enabled Blackberry phones with a drop-down menu application by Freeance. This application mirrors the forms previously used in channel trash studies, without the need to manually enter the data into a database program. Additionally, the City Corps crews have the opportunity to photograph unusual trash types, which become part of the database.



Real-time data is linked to desktop computers by the application and the Blackberry server. An example screen shot for Nyeland Drain monitoring (teal) is shown below:

All monitoring data points are in yellow.

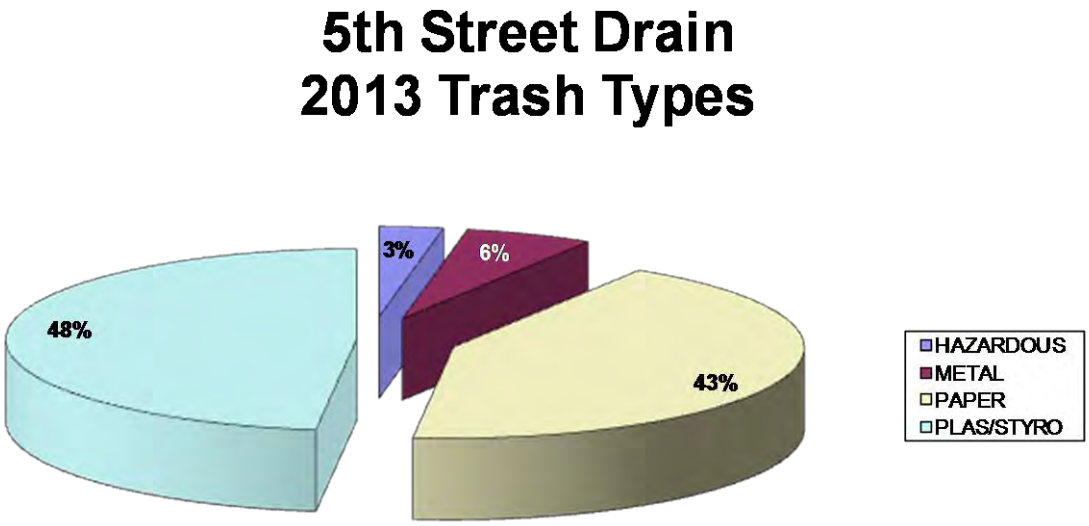
Section 4
Trash Data

The data from the three drains may be exported to database programs for further analysis and submittal to the Regional Board. A description of the drain data collected and included in this annual report follow, and the truncated data sets are included in Attachments 1 through 3.

4.1 5th Street Drain

Test runs of the data collection and management program were performed on the 5th Street Drain which are part of the GIS layer, but are not included in the data analysis for this report. Additionally, trash removal efforts were made upstream of the city limit (Project) line, and these data points will be retained in the layer, but will not be part of the data analysis or reporting.

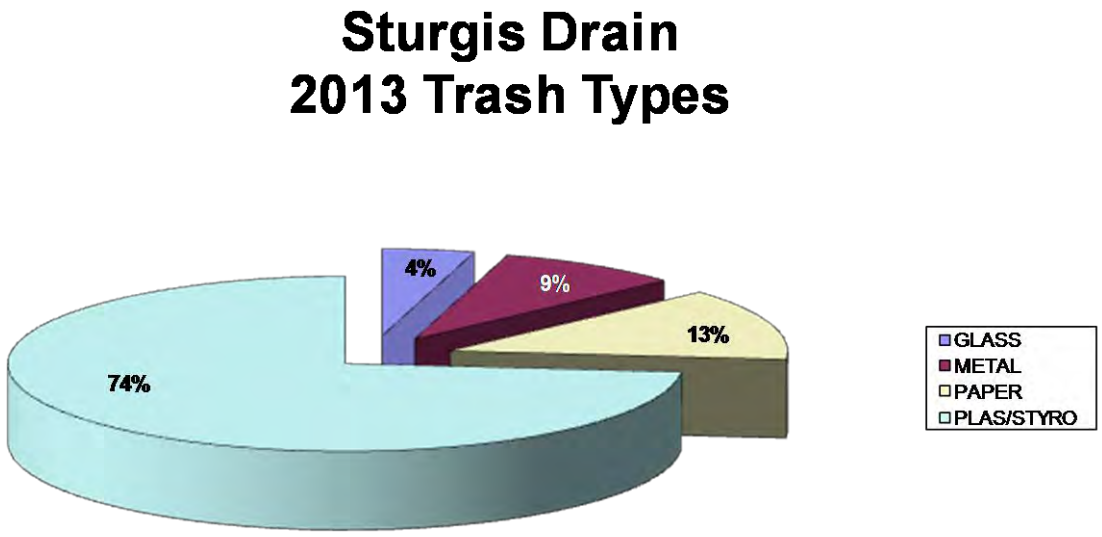
145 pieces of trash were recovered and tabulated in 2013. The relative percent of types of trash in the major categories is depicted below:



4.2 Sturgis Drain

138 pieces of trash were recovered and tabulated in 2013. Since the monitored section of channel is fenced, it is difficult to determine the source of these pieces. However, the Sturgis Drain is also monitored upstream of the study area. The upstream area is mixed commercial/industrial (fenced) and agricultural (partially fenced).

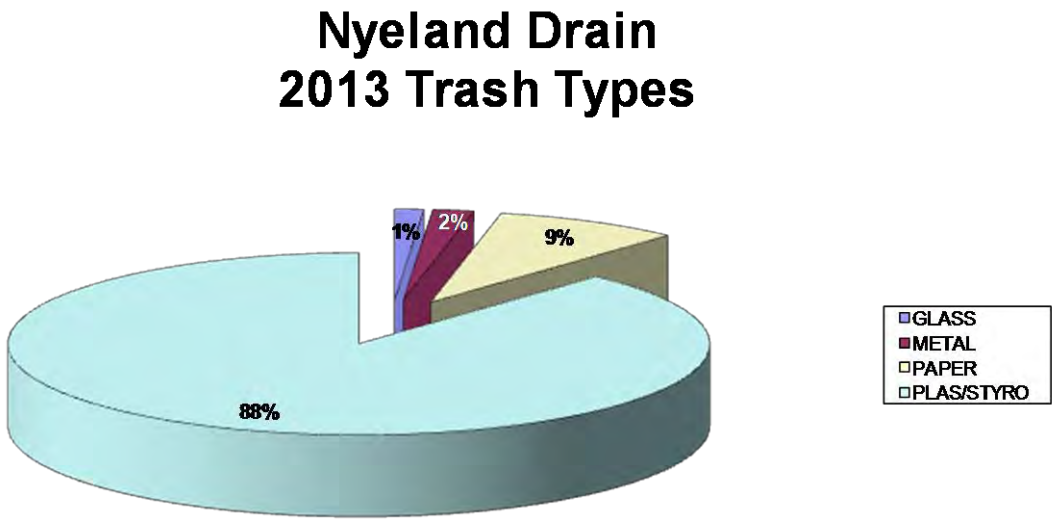
The historical data show the same types of trash in approximately the same proportions, the relative percent of types of trash in the major categories is depicted below:



4.3 Nyeland Drain

The Project area for Nyeland Drain extends from where the drain daylights north of Auto Center Drive to its juncture with Santa Clara Avenue. This area has a mix of commercial use with fast food and retail shopping facilities.

391 pieces of trash were recovered and tabulated in 2013. The relative percent of types of trash in the major categories is depicted below:



Section 5
Data Analysis and Recommendations

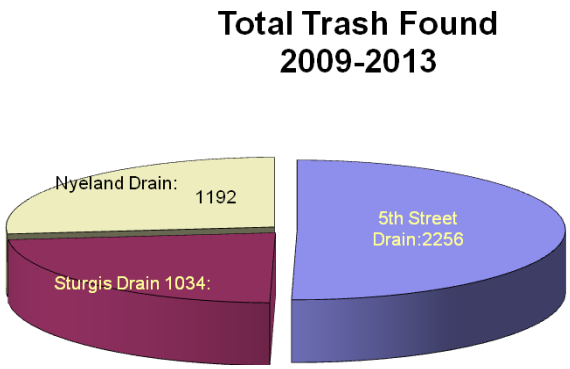
Monitoring for the Trash TMDL has been on-going since December 2009. All channels have been monitored this year. As discussed with Regional Board staff last year, the data are showing a greater than expected amount of wind-blown trash, with the highest percentages of trash removed being plastic and paper.

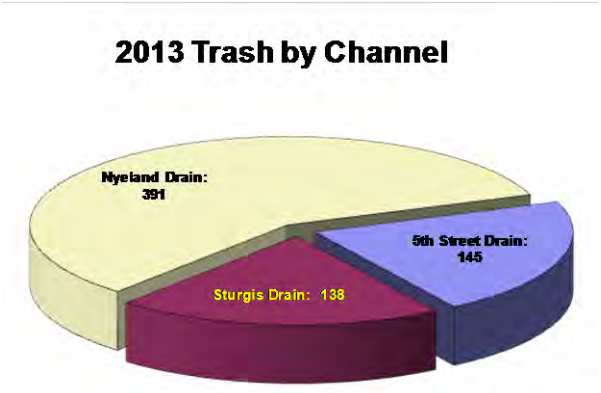
While we experienced less intense wind events in 2013, the trash observed continued to be predominately plastic and Styrofoam. It is clear from the fenced channel data, Sturgis Drain, that less overall trash is found when there is less exposure to wind. In addition to the trend analyses in Section 5.5 of this report, there are analyses of identifiable trash with possible sources, and a comparison of amounts found to the TMDL-required reductions in trash.

The data tend to confirm that the major pathway of trash entering the channels is overland by wind, and the data indicate that there are sporadic correlations between labeled trash and a local source.

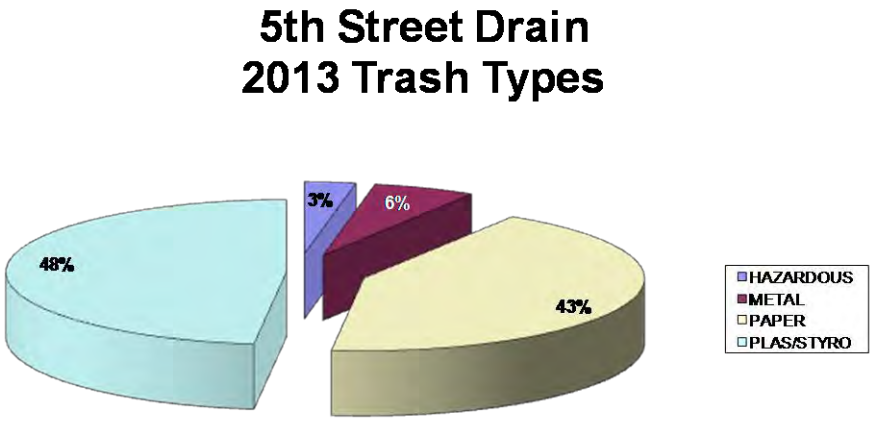
5.1 Observations

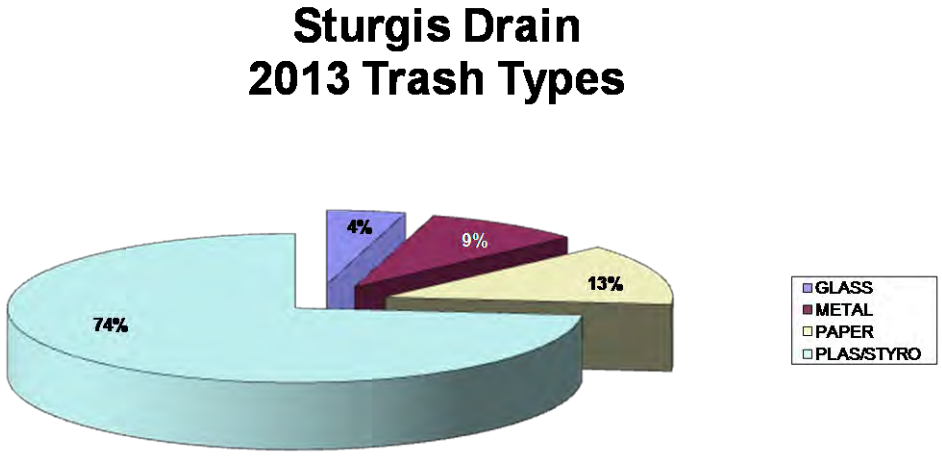
From 2009-2013 the largest numbers of trash were found in the 5th Street Drain. This is probably due to the large amount of vehicular traffic. 5th Street Drain had the closest percentages between plastic/Styrofoam and paper classes of trash, which may also indicate trash thrown or blown from vehicles. Below is a comparison between long-term trash numbers and 2013 trash collection numbers for the three channels.

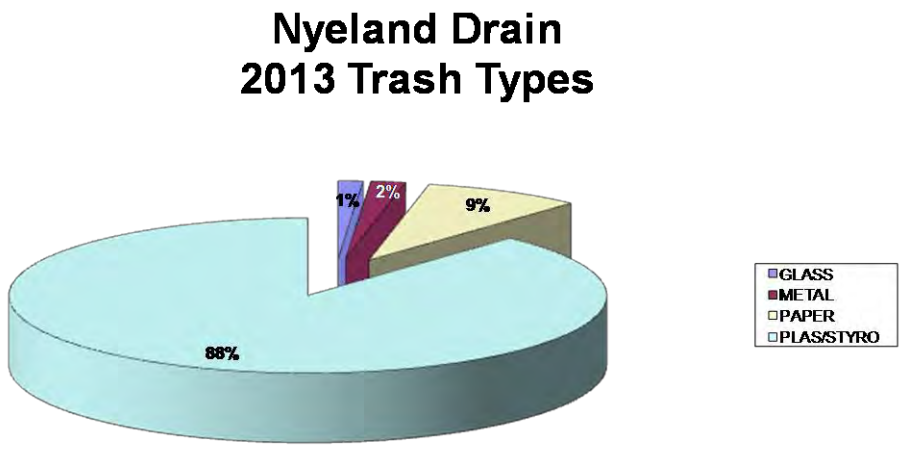




For the three channels that had trash types other than plastic and Styrofoam, the relative amounts of the major types of trash are shown below:

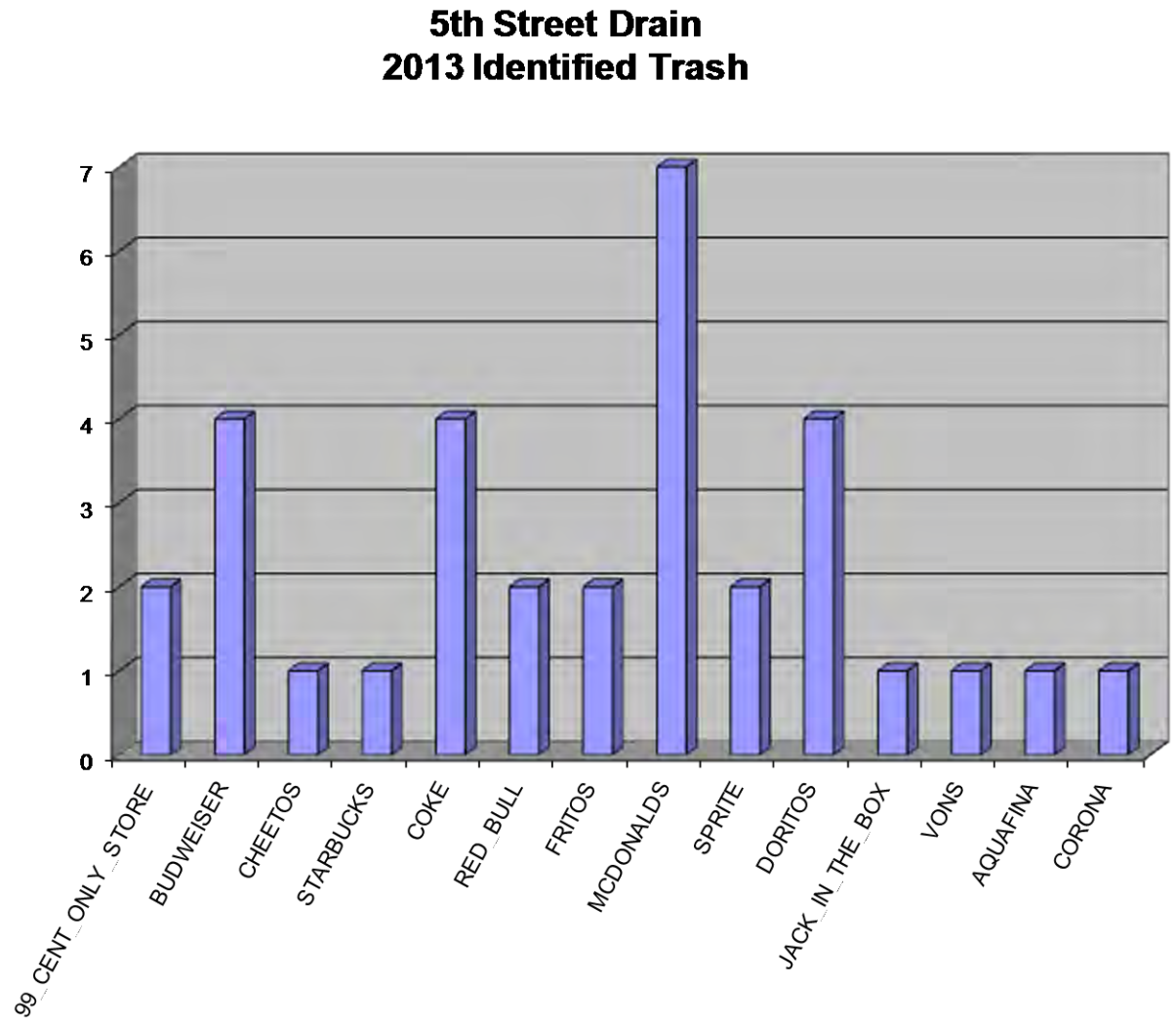




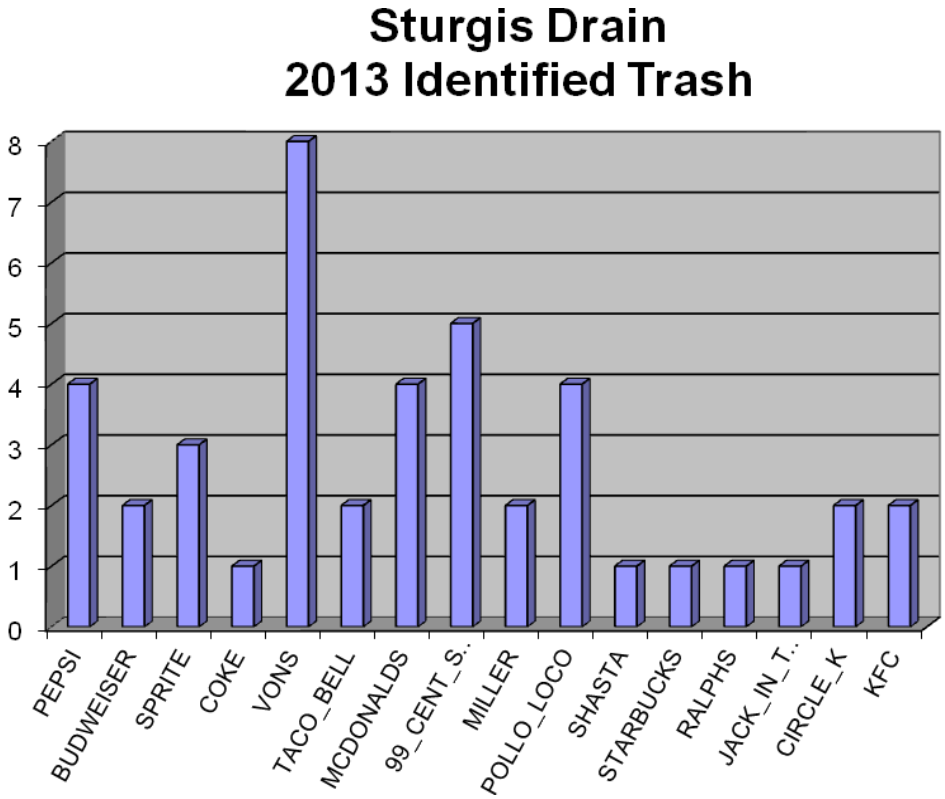


In the 5th, Nyeland, and Sturgis Drains, all other classes of trash were masked by the overwhelming amount of plastic/Styrofoam trash found. The amount of trash in the Nyeland Drain was above the baseline, likely due to the wind events of 2013. The 5th Street and Nyeland Drains have little or no fencing to protect the channel from wind-blown trash. In contrast, the Sturgis Drain, as it traverses the agricultural land on its way to the Revolon Slough, is closely bordered by fencing on both sides. It is difficult at this stage of the program to determine the sources of the wind-blown trash, as the high winds, usually predominantly Santa Anas, were blowing in both directions this year.

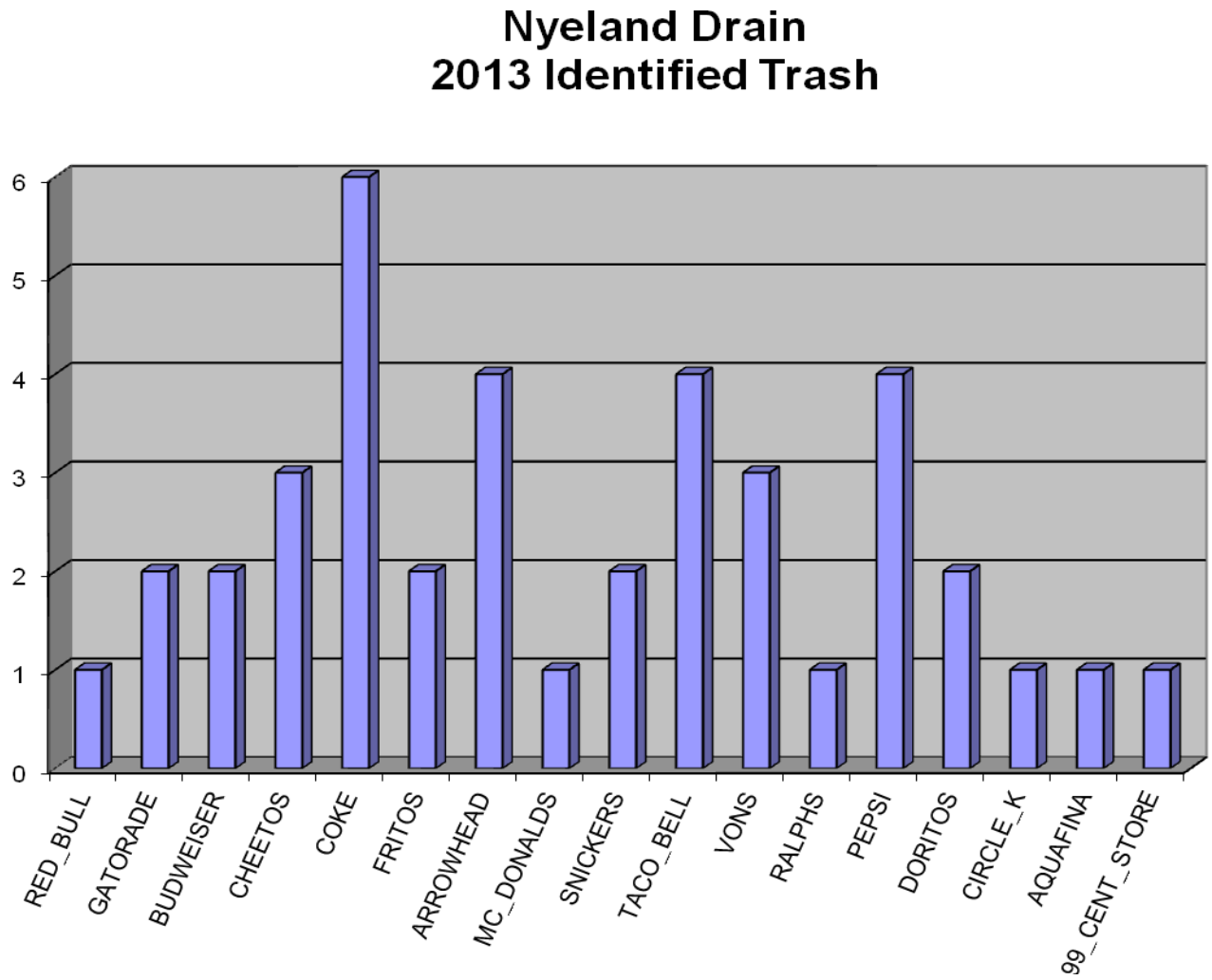
5.2 5th Street Drain



5.3 Sturgis Drain



5.4 Nyeland Drain

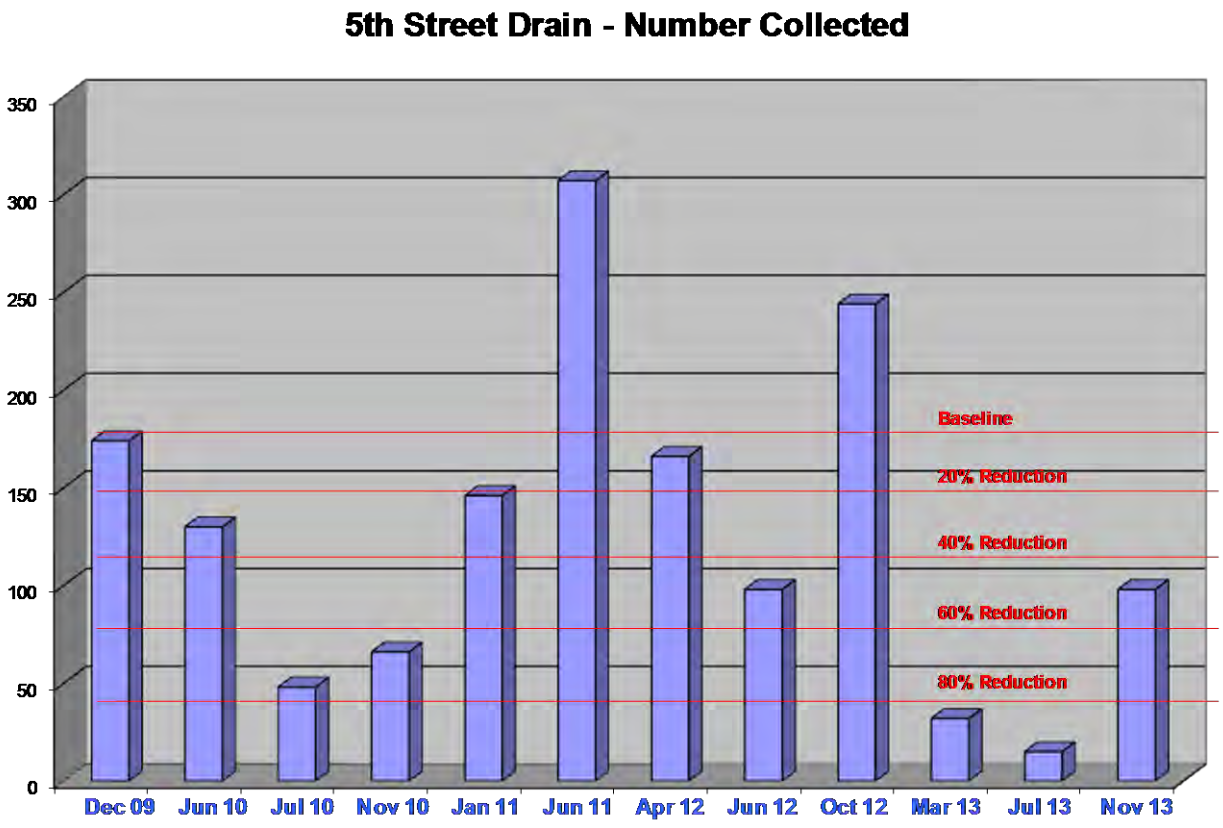


Food Establishments in the Nyeland Drain Basin

5.5 Comparison to Baseline

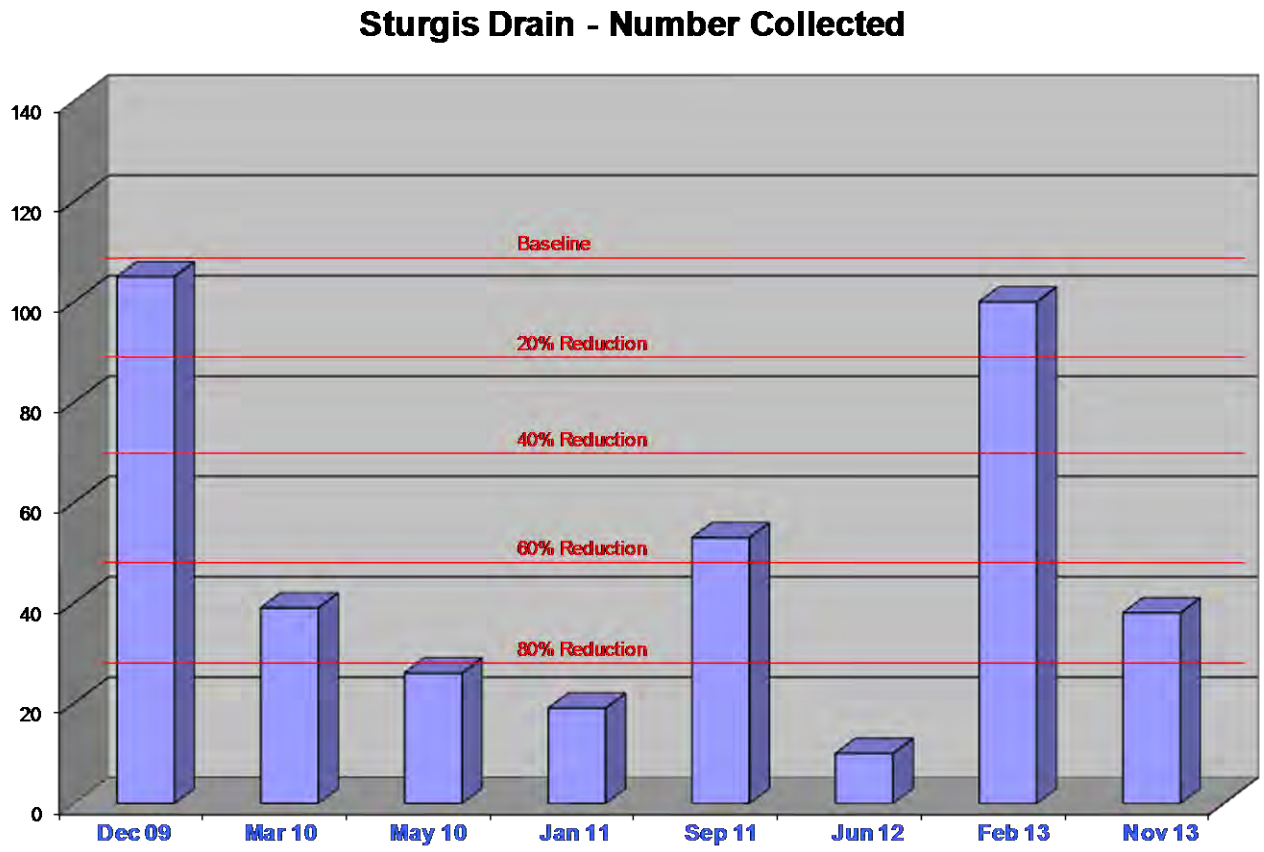
All three channel segments had three monitoring and removal events from December 2009 to December 2010. As hoped, the second event showed far less trash removed, with a further, smaller, reduction in trash removed during the final event. Eventually, we expected the number of pieces removed to stabilize to a true baseline, measuring enhanced BMP performance. It is against this baseline that we would like to compare pre- and post- full capture device results.

This has not been the case for the 5th Street, Sturgis, and Nyeland Drains, as seen in the following total numbers of trash found graphics, by channel:



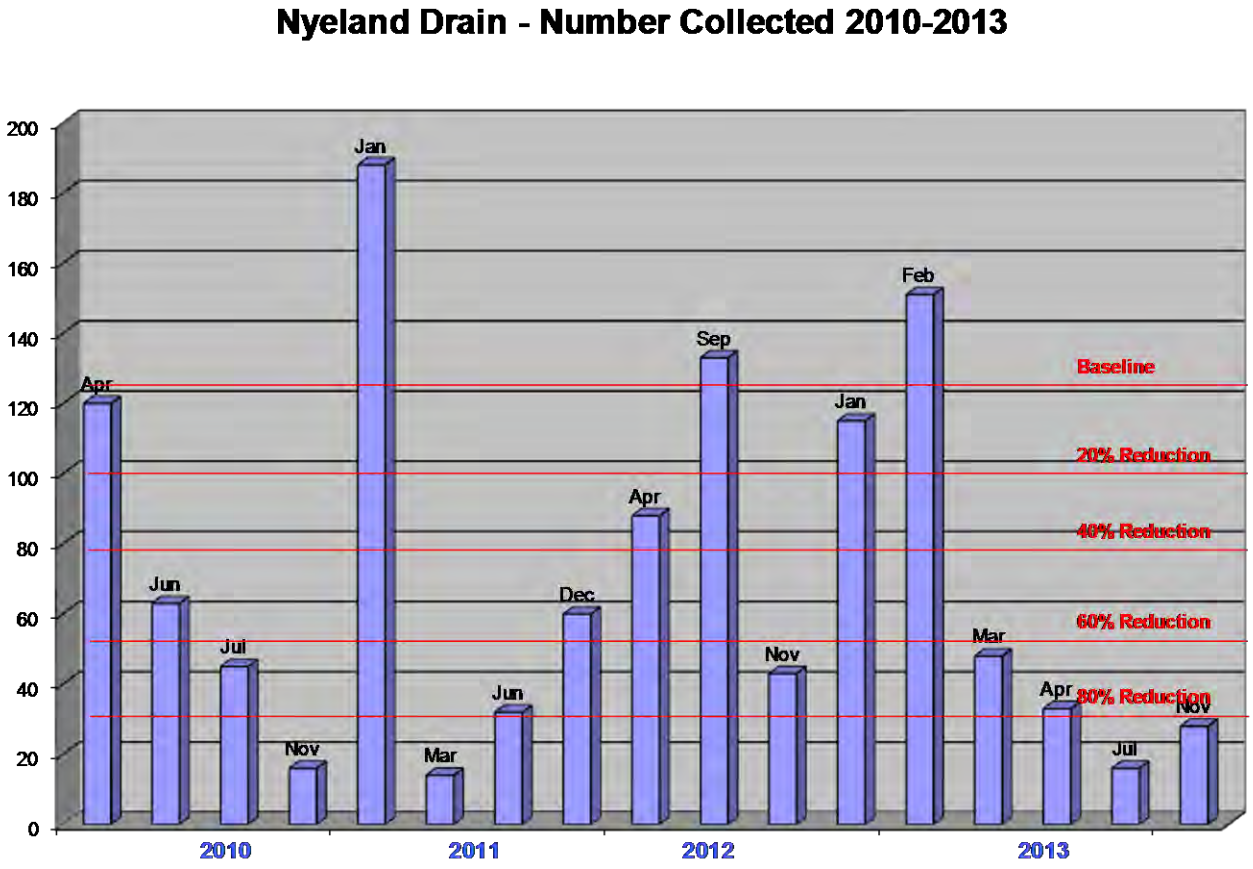
Sturgis Drain

Sturgis Drain shows an upward trend for the first monitoring event of the year; however, November's collection saw a decrease in trash to a level below the baseline monitoring.

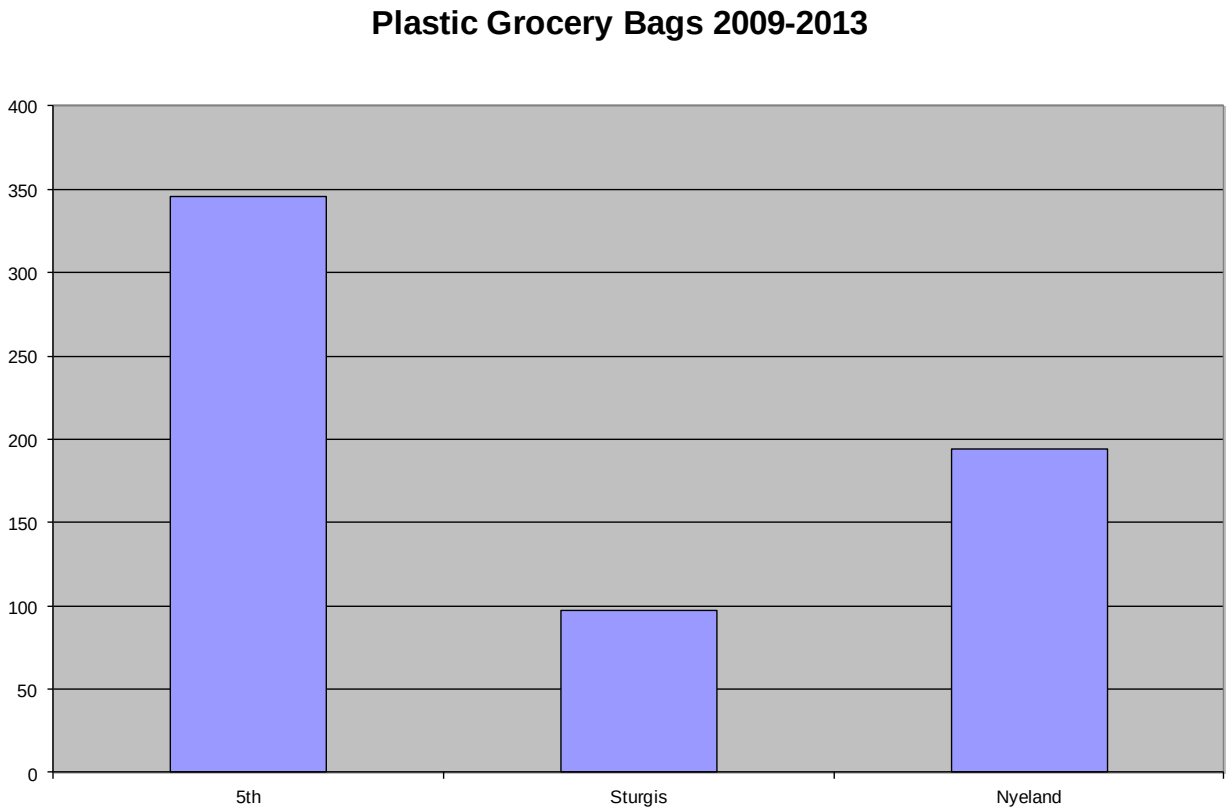


Nyeland Drain

The Nyeland Drain showed a upward trend above the baseline monitoring level for February; however, the rest of the year saw a decrease in trash to a level below the baseline monitoring.



As mentioned earlier in the report, the Measure O Citizen Oversight Committee did not allocate any money for storm water projects so the City has not yet been able to install full-capture devices for the catch basins in the drainage basins leading to Revolon Slough / Beardsley Wash. We are in the process of reviewing options for funding the installation of full-capture devices and hope to prepare a request for proposal to complete this project once a funding source is secured.



Additional trash management efforts include the regional bag-ban being spearheaded by BEACON (Beach Erosion Authority for Clean Oceans and Nourishment). The City of Oxnard has contributed funds to BEACON to prepare an Environmental Impact Report, it is part of the first step to establishing a regional bag-ban ordinance. This would address much of the wind-blown trash issues in the TMDL channels by addressing market plastic bags.

JANUARY 2014

Ventura River Estuary
2012-2013 Trash TMDL
TMRP/MFAC Annual Report

submitted to

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD,
LOS ANGELES REGION

on behalf of the

CITY OF VENTURA, COUNTY OF VENTURA, VENTURA COUNTY WATERSHED PROTECTION DISTRICT, PARTICIPANTS IN THE VCAILG, CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE, CALIFORNIA STATE PARKS, AND CALIFORNIA DEPARTMENT OF TRANSPORTATION

LARRY WALKER ASSOCIATES

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Executive Summary

The purpose of this report is to present the results of the fourth-year monitoring between October 2012 and September 2013. Implementation efforts were conducted in accordance with the Trash TMDL (effective March 6, 2008) and Trash Monitoring and Reporting Plan (TMRP) and Minimum Frequency of Assessment and Collection/ Best Management Practice (MFAC/ BMP).

The responsible parties are currently complying with the non-point source requirements of the Trash TMDL through the implementation of a MFAC/ BMP Program and complying with the point source requirements through the installation of certified trash full capture devices on all conveyances discharging to Ventura River Estuary. The responsible parties are currently meeting the point source requirement for 2014 of certified trash full capture devices installed on 60 percent of the conveyances discharging to the estuary.

Based on the trash data collected during the past four years of monitoring as well as the identification of homeless camps as the primary source of trash in the estuary, the responsible parties, the Regional Board, and other interested parties agreed that the current MFAC/ BMP Program should be revised. The responsible parties are developing a revised TMRP to include a new MFAC/ BMP Program that utilizes targeted clean ups of the parcels located within the estuary coupled with BMPs implemented on the land areas adjacent to the estuary. The proposed MFAC/ BMP program is as follows:

1. Conduct quarterly cleanups of all parcels in the Estuary
2. Conduct quarterly visual assessment of trash starting in the first quarter of 2014
3. Begin regular patrols of Estuary parcels to prevent homeless encampments
4. Conduct regular cleanups or employ additional BMPs in Estuary-adjacent parcels

A revised TMRP presenting a detailed monitoring and reporting strategy will be submitted in April 2014. Steps for transitioning from the existing TMRP approach and MFAC/ BMP Program to the new program were approved by the Regional Board on October 23, 2013 and include:

1. Conduct quarterly cleanups of all Estuary parcels below Main Street.
2. Begin regular patrols by January 2014.
3. Define trash assessment program including field procedures and assessment areas.
4. Conduct assessment event by March 2014 to test the assessment process and identify the protocol and schedule for the patrols and cleanups for each parcel.
5. Submit a revised TMRP in April 2014 that includes the specific procedures for visual assessments, the schedule for cleanups, and the assessment process.
6. Implement the revised TMRP and MFAC/ BMP Program unless directed by the Regional Board staff otherwise.

The next annual monitoring report will present the assessment results in accordance with the revised TMRP.

In addition, the responsible parties will continue to install full capture devices on all their conveyances discharging to the estuary to meet the point source requirements of the Trash TMDL.

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Overview

This Annual Report is being submitted to fulfill the compliance requirements of the Amendments to the Water Quality Control Plan – Los Angeles Region for the Ventura River Estuary Trash TMDL (Trash TMDL), Resolution No. R4-2007-008. The purpose of this report is to present the results of the fourth-year monitoring efforts conducted in accordance with the Trash TMDL (effective March 6, 2008) Trash Monitoring Reporting Plan (TMRP) and Minimum Frequency Assessment Collection/ Best Management Practice (MFAC/ BMP) Program.

The Annual Report includes:

- Data summary and analysis;
- Data evaluation;
- Compliance strategy; and
- Proposed revisions to MFAC/ BMP Program.

This effort is being completed on behalf of the responsible parties to the Trash TMDL as listed in **Table 1**.

Table 1. Responsible Parties Participating in the TMRP and MFAC Program

Responsible Party	Nonpoint Source (NPS)	Point Source (PS)
City of Ventura (City)	X	X
Ventura County (County)	X	X
Ventura County Watershed Protection District (VCWPD)	X	X
California Department of Food & Agriculture (Ventura Fairgrounds)	X	X
Caltrans	X[1]	X
California Department of Parks and Recreation	X	
Participants in the VCAILG[2]	X	

1. Caltrans was not given a NPS Load Allocation (LA) in the TMDL yet is voluntarily participating in the MFAC to meet the TMDL goals.
2. Ventura County Agricultural Irrigated Lands Group.

To complete this effort, the responsible parties hired the California Conservation Corps (CCC) to conduct all field monitoring efforts and Larry Walker Associates (LWA) to oversee monitoring and complete reporting requirements. The monitoring efforts were conducted according to the TMRP, which is based on a modified version of the Rapid Trash Assessment Protocol (RTAP) developed by members of the San Francisco Bay Regional Board's Surface Water Ambient Monitoring Program (SWAMP). The RTAP was modified to better suit the goals of the TMRP Program. The Responsible Parties have revised the TMRP throughout the implementation period based on experience gained during implementation of the TMRP and MFAC/ BMP Program. Major revisions include: (1) transitioning point sources from demonstrating compliance through the MFAC/ BMP Program to compliance through full capture devices; (2) using trash weight instead of pieces of trash as the metric to gage MFAC/ BMP Program effectiveness; and (3) removing the sites considered to be low trash generating areas from the TMRP. The previous Annual Reports submitted to the Regional Board have documented these revisions.

Assessment Site Locations

SITE LOCATIONS AND MONITORING FREQUENCY

The initial TMRP required trash assessments at nine locations including set assessment sites and rotating assessment sites (Site 1 and Site 2). The fourth-year assessment sites listed below are also depicted in **Figure 1** and detailed in **Appendix 1.** Assessment Site Descriptions.

Assessment Sites

- Site 1: Lower Ventura River Estuary Below U.S. 101 Freeway (MFAC)
- Site 2: Upper Ventura River Estuary Below U.S. 101 Freeway (MFAC)
- Site 3: Sandy beach area between the estuary and the ocean and along the bike path (MFAC)
- Site 4: Ventura County Fairgrounds: defined as the area where water is discharged from the catch basin to the estuary (MFAC)
- Site 5: Front Street Storm drain (MFAC)
- Site 6: Ventura River at State Freeway 33 and Shell Road
- Site 7: Ventura River near State Freeway 33 at Casitas Vista Road (above City of Ventura)
- Site 8: Caltrans site on State Freeway 33 near Stanley Avenue on-ramp

Figure 1. TMRP MFAC Assessment Site Locations

Completed Monitoring Events

Fourth-year monitoring for the Trash TMDL was conducted from October 2012 to September 2013 at the frequencies detailed in **Table 2**. See **Table 3** for completed monitoring events. The monitoring frequencies at Sites 1, 2 and 3 have been modified from the frequency outlined in the TMDL in accordance with proposed modifications provided in previous annual reports. Site 1 and Site 2 was adjusted from a quarterly to a monthly basis, starting with the second year of monitoring, in order to provide for a better understanding of the characteristics of the estuary. Monthly sampling of Site 1 and Site 2 continued for the fourth year of monitoring. Site 3 monitoring frequency was modified from weekly to monthly starting during fourth-year monitoring in accordance with the recommended revisions to the MFAC Program proposed in the second- and third-year Annual Reports.

Table 2. Monitoring Event Frequency

Site	Frequency
Site 1 - Lower Estuary below U.S. 101 Freeway[1]	Once per Month (Required to be included in MFAC)
Site 2 - Upper Estuary below U.S. 101 Freeway[1]	Once per Month (Required to be included in MFAC)
Site 3 - Sandy Beach Area[2]	Once per Month (Required to be included in MFAC)
Site 4 - Ventura County Fairgrounds	Once Monthly and after major public events that occur in the Ventura County Fairground that charge an admission price and are attended by greater than 7,000 people. (Required to be included in MFAC)
Site 5 - Front St. Storm Drain	Once per Month (Required to be included in MFAC)
Site 6 - Ventura River off Ventura Rd.	Once per Month
Site 7 - Casitas Vista Rd. at State 33 Freeway	Once per Month
Site 8 - Caltrans site off Hwy. 33	Once per Month

1. These sites are listed as a quarterly MFAC requirement in the Trash TMDL but the frequency has since been increased to monthly monitoring to give a better representation of the estuary.
2. This site was required to be sampled weekly from May 15th 2012 to October 15th 2012. However, based on monitoring results, the Responsible Parties proposed to reduce the frequency to monthly in the 2010-2011 and 2011-2012 Annual Reports. This change was implemented for fourth-year monitoring.

Table 3. Completed Monitoring Events (October 2012 – September 2013)

Site	Month / Quarter											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	Q1			Q2			Q3			Q4		
1	X	X	X	X	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X	X	X	X	X
3	X[1]	X	X	X	X	X	X	X	X	X	X	X
4[2]	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X

X = monitoring event completed

1. Required weekly sampling events at Site 3 completed during given month
2. All required monitoring events occurred after a Ventura County Fairgrounds event with over 7,000 participants

Data Summary and Analysis

This section presents the quantities and locations of trash collected during the fourth year of monitoring.

TRASH COLLECTED

The CCC collected or otherwise accounted for all trash greater than five millimeters. Trash collected in the field is weighed at the conclusion of each site cleanup. Five of the eight monitoring sites had more trash, by weight, in-stream or in the wetted area than on the banks.

TRASH WEIGHT

During the fourth year of monitoring, approximately 476.6 pounds of total trash were collected. Elevated levels of trash were found primarily during January 2013 and November 2012, and also during April 2013. In addition, Site 5, Site 2, Site 4, and Site 3 had higher amounts of trash compared with the other monitored sites, although the collection frequency at Site 3 was slightly greater than that performed at the other sites. **Table 4** lists the total weight of trash collected per site and per month for the 2012-2013 monitoring year.

Table 5 lists the total weight of trash collected per site and per month for the previous monitoring year, and is provided for comparison with the 2012-2013 results. **Figure 2** shows the total weight of trash collected per month per site during 2012-2013

Table 4. Total Weight of Trash Collected per Site and per Month (October 2012 – September 2013)

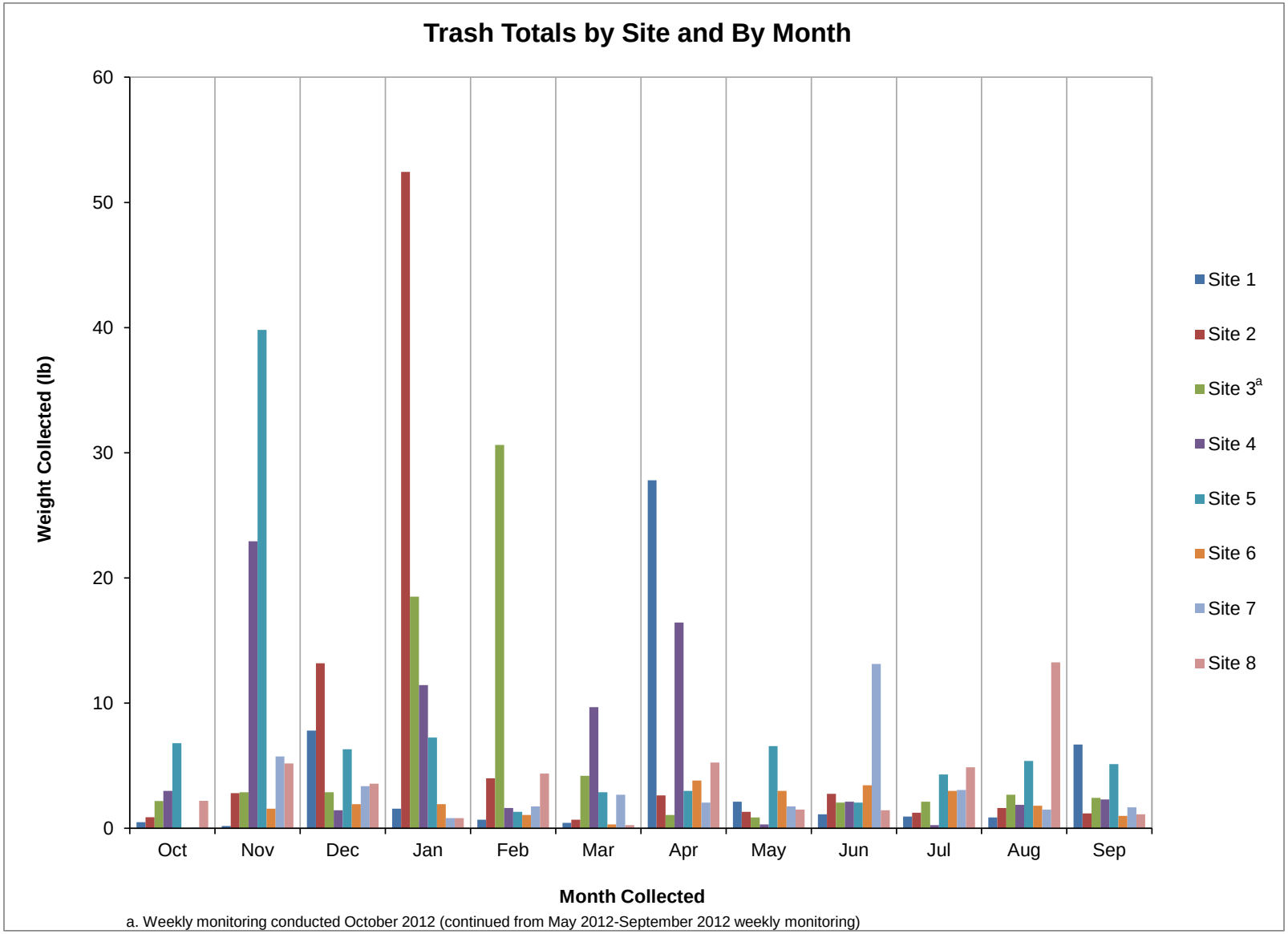
Site	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Weight per site (lb)
Site 1	0.50	0.19	7.81	1.56	0.69	0.44	27.81	2.13	1.13	0.94	0.88	6.69	**50.8**
Site 2	0.89	2.81	13.19	52.44	4.00	0.69	2.63	1.31	2.75	1.25	1.63	1.19	**84.8**
Site 3	2.19[1]	2.88	2.88	18.50	30.63	4.19	1.06	0.88	2.06	2.13	2.69	2.44	**72.5**
Site 4	3.00	22.94	1.44	11.44	1.63	9.69	16.44	0.31	2.13	0.25	1.88	2.31	**73.4**
Site 5	6.80	39.81	6.31	7.25	1.31	2.88	3.00	6.56	2.06	4.31	5.38	5.13	**90.8**
Site 6	0.03	1.56	1.94	1.94	1.06	0.31	3.81	3.00	3.44	3.00	1.81	1.00	**22.9**
Site 7	0.08	5.75	3.38	0.81	1.75	2.69	2.06	1.75	13.13	3.06	1.50	1.69	**37.6**
Site 8[2]	2.20	5.19	3.56	0.81	4.38	0.25	5.25	1.50	1.44	4.88	13.25	1.13	**43.8**
Weight per month (lb)	**15.7**	**81.1**	**40.5**	**94.8**	**45.4**	**21.1**	**62.1**	**17.4**	**28.1**	**19.8**	**29.0**	**21.6**	**476.6**

1. Includes trash collected on a weekly basis.
2. Site 8 data includes trash from both the freeway and a stormwater channel west of State Route 33. This stormwater channel receives drainage from the immediate area on the freeway and a substantial drainage area in the City of Ventura to the east.

Table 5. Total Weight of Trash Collected per Site and per Month (October 2011 – September 2012)

Site	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Weight per site (lb)[1]
Site 1	4.40	10.10	0.68	0.08	0.14	0.04	0.01	0.00	0.00	0.00	0.01	0.00	**15.5**
Site 2	0.14	0.50	1.11	1.06	1.50	2.13	0.00	0.10	0.60	0.04	0.50	0.02	**7.7**
Site 3	4.20	6.06	12.81	0.46	5.51	3.32	5.20	0.04	0.53[2]	9.97[2]	1.28[2]	8.82[2]	**58.2**
Site 4	34.77	13.50	5.20	1.26	0.31	0.09	6.20	0.30	8.00	0.18	3.75	2.70	**76.3**
Site 5	12.81	17.00	6.94	11.20	14.30	3.92	6.95	16.04	9.51	15.90	0.14	3.15	**117.9**
Site 6	0.05	6.60	0.82	0.40	0.13	0.03	0.05	0.00	1.20	0.11	0.10	0.50	**10.0**
Site 7	1.05	2.38	1.10	0.39	0.04	0.08	1.80	0.08	1.42	0.07	3.70	2.90	**15.0**
Site 8[3]	0.58	0.46	0.16	0.38	0.20	0.48	0.28	0.29	3.27	0.79	6.83	0.89	**14.6**
Weight per month (lb)	**58.0**	**56.6**	**28.8**	**15.2**	**22.1**	**10.1**	**20.5**	**16.9**	**24.5**	**27.1**	**16.3**	**19.0**	**315.0**

1. Weight data presented in this table supersedes the 2011-2012 weight data reported in the 2011-2012 annual report, which contains calculation errors due to unit conversions.
2. Includes trash collected on a weekly basis.
3. Site 8 data includes trash from both the freeway and a stormwater channel west of State Route 33. This stormwater channel receives drainage from the immediate area on the freeway and a substantial drainage area in the City of Ventura to the east.



a. Weekly monitoring conducted October 2012 (continued from May 2012-September 2012 weekly monitoring)

Figure 2. Weight of Trash Collected per Month per Site (October 2012 – September 2013)

COMPARISON OF TRASH PIECES AND WEIGHT

During third-year monitoring (2011-2012) MFAC events, the number of trash pieces was also recorded. As discussed in the 2011-2012 annual report, the primary trash metric shifted from number of pieces to weight starting with the fourth year of monitoring. However, a comparison between the two metrics is provided here to demonstrate the variability in trash monitoring results and the difficulty in defining a trash metric that adequately represents trash.

Figure 3 compares the monthly totals for trash weight and number of pieces, and **Figure 4** compares trash totals by site.

During fourth-year monitoring, approximately 6,944 pieces of trash were collected. Based on the results presented in the third-year annual report[1], the total amount of trash collected appears to have decreased (by 22 percent) between the third and fourth monitoring years. Though the trash weight metric indicates an increase in trash, the trash pieces metric indicates a decrease instead. As shown in the figures, trash levels are highly variable and the metrics are dependent on the types of trash present (*e.g.*, numerous, tiny fragments vs. a few heavy objects). So at some sites, a large number of pieces were collected with a relatively low weight (e.g. Site 8), at others, a comparably small number of pieces were collected with a relatively higher weight (e.g. Site 5).

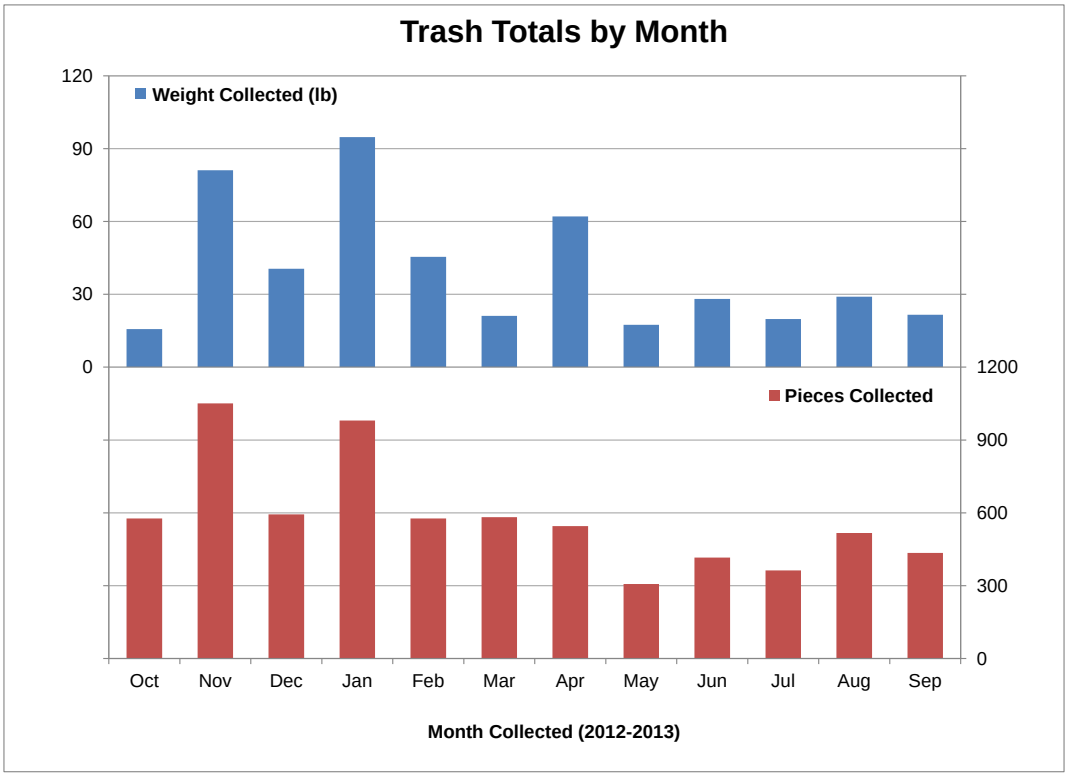


Figure 3. Total Trash Collected per Month (October 2012 – September 2013)

[1] A total of 8,919 pieces of trash were collected during the third monitoring year.

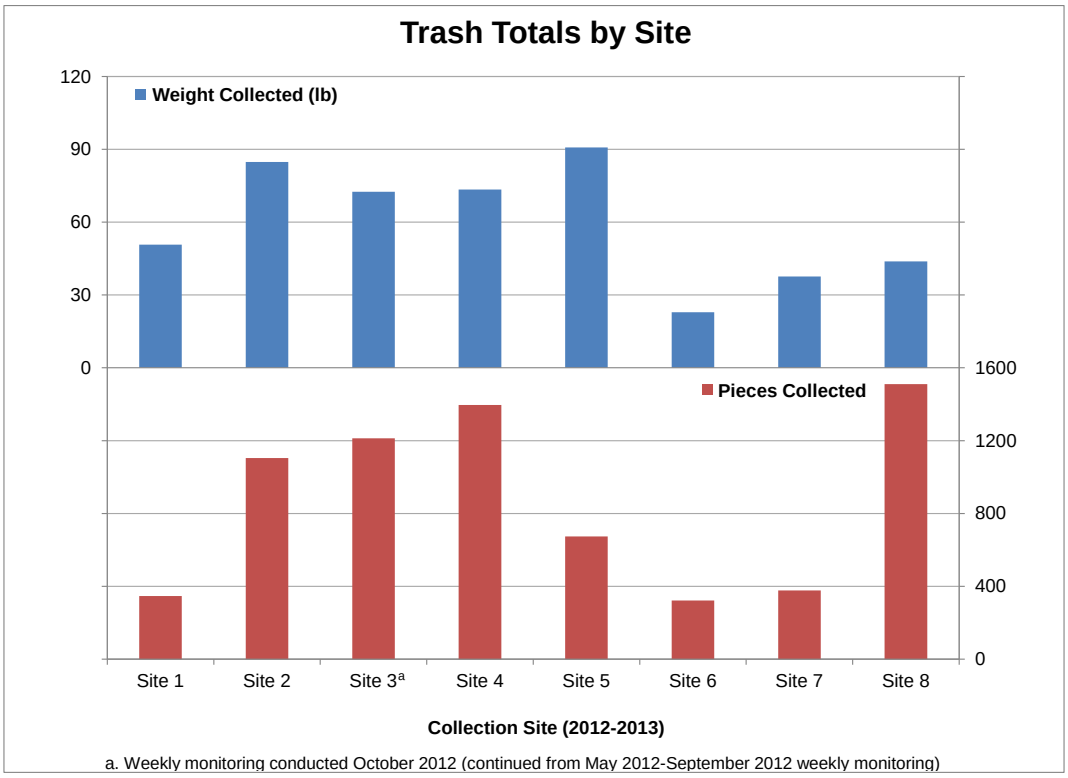


Figure 4. Total Trash Collected per Site (October 2012 – September 2013)

Data Evaluation

Trash data collected from the fourth year of monitoring were evaluated to determine MFAC/ BMP Program effectiveness and were also evaluated to identify high trash generating areas where implementation actions may be focused. The following sections provide information on MFAC/ BMP Program effectiveness and high trash generating areas.

MFAC/ BMP PROGRAM EFFECTIVENESS

As outlined in the TMRP, an assessment of MFAC/ BMP Program effectiveness was to be conducted after the each year of monitoring. The following steps were used to assess MFAC/ BMP Program effectiveness:

1. A review of BMP implementation, including identification of BMPs, location of BMPs, and time frame (*e.g.*, when an activity was implemented or installed); and
2. A comparison of monitoring results between monitoring locations and between events before and after BMP implementation.
3. Comprehensive review and assessment of MFAC/ BMP program

Given the broad nature of most of the BMPs implemented to date (*e.g.*, education programs, ordinances, street sweeping), the highly variable amounts of trash collected over the four years, and the relatively short time frame that full capture devices have been installed, trends were not identified in the monitoring data that could be used to determine effectiveness of individual BMPs. In addition, trash monitoring from the past four years indicates that trash levels are highly variable. During the second monitoring year (2010-2011), implementation of the MFAC/ BMP program appeared to result in significant trash reductions. However, during the third year (2011-2012), the trash levels increased at the same time that additional BMPs were being implemented and full capture devices were being installed. During the fourth monitoring year, the trash levels decreased slightly based on trash pieces, but increased based on trash weight, despite additional BMPs that were implemented.

As such, the implementation of the MFAC/ BMP program is not clearly reflected in the trash monitoring results. Based on this assessment, a modified MFAC/BMP program was developed and will be implemented during the 2013-2014 monitoring year. The proposed revisions to the MFAC/BMP program are discussed in the Compliance Strategy section.

HIGH TRASH GENERATING AREAS

Site 5 and Site 2 had the highest trash weight totals during the monitoring period and were considered high trash generating sites. In addition, Site 4 and Site 3 also had high trash weight totals. These sites were also considered high trash generating areas. Site 5 had 90.8 pounds of trash, Site 2 had 84.8 pounds of trash, Site 4 had 73.4 pounds of trash, and Site 3 had 72.5 pounds of trash. **Table 4** lists the trash weight totals for all of the monitoring sites.

Site 5 had the highest total trash weight of all the sites. Site 5 is located beneath the Front Street Storm Drain near a large section of Arundo that is clearly inhabited by a large homeless population. There are several trails near Site 5 that are heavily used by the homeless and other visitors to the estuary. In addition, the responsible parties have determined that there is a

significant amount of trash buried in the stream substrate just below the Front Street Storm Drain that is continually being exposed due to erosion, and that its existence may lead to the elevated amounts of trash found at the site.

Site 2 had the second highest total trash weight of all the sites. Site 2 is located on the western side of the Estuary downstream of areas of the Estuary that are known to contain or have contained numerous homeless camps. It is likely that trash accumulating at this site is primarily emanating from upstream homeless camp sources.

Site 4 had the third highest total trash weight of all the sites. Site 4 is located between Site 3 and Site 5 on the other side of the bike path from the Ventura County Fairgrounds and consists of rip rap, vegetation, and portions of the estuary's main water body. As with Site 3, this area has high visitation due to its proximity to the bike path and the beach. In addition, the majority of the trash is found within the rip rap along the bank of the estuary and often includes food- and drink-related waste, and other items indicating that the trash is from people using the rip rap as a place to associate.

Site 3 had the fourth highest total trash weight of all the sites. Site 3 is located directly next to a bike path along the sandy beach area at the end of the estuary adjacent to the Pacific Ocean. Based on the data and field observations, this area of the Ventura River Estuary receives increased amounts of visitation resulting from its close proximity to the beach and bike path. In addition, the trash collected here generally consists of very small pieces which often comingle with the organic materials along the estuary/ shoreline interface. Appendix 3 of the 2011-2012 annual report includes photos of trash collected at Site 3 to illustrate the small sizes of trash pieces collected at this site.

The information on the high trash generating sites will be used to inform the revisions to the TMRP and MFAC/BMP program proposed in the Compliance Strategy section.

Compliance Strategy

The Trash TMDL requires all annual reports to include proposals to enhance BMPs and to revise the MFAC (if needed) and prioritize the installation of full capture devices or other compliance measures including structural BMPs or trash collection events for high trash generating areas. Additionally, the Trash TMDL requires point source-responsible parties to install full capture systems at 100 percent of the conveyances discharging to the estuary by 2016. This section describes the proposed compliance strategies to be utilized to meet the Trash TMDL requirements.

As discussed in the third year (2011-2012) annual report, the results of the third monitoring year showed an unexpected increase in trash discharges into the estuary. During the fourth monitoring year, the responsible parties continued to note highly variable monitoring results and a lack of consistent trends in trash levels. As such, the fourth year evaluation resulted in some major modifications to the compliance strategy proposed by the responsible parties in the previous annual reports. The proposed approach and suggested modifications are identified below.

CURRENT TMRP APPROACH

The original TMRP approach included utilizing a MFAC/ BMP Program to address the point source and non-point source requirements of the Trash TMDL. Through initial monitoring, the responsible parties identified that the primary source of trash to the estuary was non-point sources (particularly homeless encampments) and as a result the trash monitoring results were highly variable and decreasing trends in trash could not be observed. Based on these findings, the point source responsible parties decided to shift from compliance with the Trash TMDL through the MFAC/BMP Program to compliance through progressive implementation of full capture devices. The modified compliance approach was discussed in the third year (2011-2012) Annual Report submitted in January 2013. The responsible parties are currently meeting the point sources trash full capture device installation requirement of 60 percent of the conveyances discharging to the estuary addressed by trash full capture devices by 2014. Non-point sources have continually been addressed by a MFAC/ BMP Program. The MFAC/ BMP Program currently assesses the amount of trash present in the Estuary through collecting and weighing the trash found in representative monitoring sites throughout the Estuary.

REVISED TMRP APPROACH

The responsible parties are developing an updated TMRP that will detail a revised MFAC/ BMP Program, which includes cleanups of all parcels in the estuary on a regular frequency combined with other BMPs that have been found to be effective in reducing the amount of trash that reaches the estuary. The MFAC/ BMP Program will utilize a streamlined visual assessment approach for evaluating the quantities of trash present over a larger portion of the estuary.

The proposed TMRP and MFAC/ BMP Program revisions are designed to prioritize the use of resources to implement actions that have been determined to be effective in reducing trash in the estuary while still providing a monitoring approach that will allow the evaluation of the effectiveness of the MFAC/ BMP Program and support identification of any needed adjustments

to the program. The proposed approach is a visual assessment using a component of the Surface Water Ambient Monitoring Program Rapid Trash Assessment Protocol (SWAMP Protocol) and visual assessment approaches being utilized by the City of Ventura, the Santa Clara Valley Urban Runoff Pollution Prevention Program in the San Francisco Bay Area, and a number of cities and municipalities throughout the country.

The visual assessments will utilize a four-point scoring system based on the "Level of Trash" scoring category discussed in the SWAMP Protocol to estimate the presence of litter in a specific area. Training will be provided for individuals who will conduct visual trash assessments to ensure consistency in the assessments. The trained scorers will score each assessed area rating the amount of litter observed as follows:

- Category 1 represents the SWAMP Category "Optimal"
- Category 2 represents the SWAMP Category "Suboptimal"
- Category 3 represents the SWAMP Category "Marginal"
- Category 4 represents the SWAMP Category "Poor"

The definition of Category 1 is:

> *"On first glance, no trash visible. Little or no trash (<10 pieces) evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves."*

The definition of Category 2 is:

> *"On first glance, little or no trash visible. After close inspection small levels of trash (10-50 pieces) evident in stream bank and streambed."*

The definition of Category 3 is:

> *"Trash is evident in low to medium levels (51- 100 pieces) on first glance. Stream, bank surfaces, and riparian zone contain litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, and clothing."*

The definition of Category 4 is:

> *"Trash distracts the eye on first glance. Stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris (>100 pieces). Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, clothing."*

The goal of the MFAC Program is to ensure the parcels of the Estuary are in Category 1 or 2.

Assessments will be conducted prior to each cleanup event for a given parcel in the Estuary. The assessment process is under development will be submitted to Regional Board staff for review and approval in April 2014. The assessment results will be used to evaluate the accumulation of trash between cleanups and to determine which areas to target during the cleanup events. All field procedures will be consistent with the approved Health and Safety Plan.

TMDL COMPLIANCE

Point source-responsible parties will continue to install the required full capture systems to meet the 100 percent installation requirement of 2016 and will inspect and maintain all installed full capture devices to ensure proper operation and effectiveness. Given that that the point sources

are attaining compliance through installation of full capture devices, the TMRP monitoring approach can focus specifically on non-point sources.

Non-point source-responsible parties will comply with the Trash TMDL by implementing a new MFAC/ BMP Program that is directly connected to and supported by the proposed TMRP approach. Designed to target the identified primary sources of trash in the estuary, the proposed new MFAC/ BMP Program was developed based on conversations with the Ventura Hillsides Conservancy on actions that have been effective in reducing the presence and accumulation of trash on their estuary parcel. The program, along with a corresponding strategy for adaptive management, is outlined in the **MFAC Revisions Section** below.

MFAC REVISIONS

A new TMRP detailing a revised MFAC/ BMP Program will be submitted in April 2014. The MFAC/ BMP Program is proposed to consist of the following:

1. Conduct quarterly cleanups of all parcels in the Estuary
2. Conduct quarterly visual assessment of trash starting in the first quarter of 2014
3. Begin regular patrols of Estuary parcels to prevent homeless encampments
4. Conduct regular cleanups or employ additional BMPs in Estuary-adjacent parcels

The visual assessment results will be used to evaluate the effectiveness of the proposed MFAC/BMP program and modify the program as needed to reflect observed trash levels. As stated above, the goal of the MFAC/BMP program is for all areas of the Estuary to be maintained in Category 1 and 2. To achieve this, the MFAC/BMP program will be continuously evaluated and modified using the following adaptive management approach:

1. Areas in Category 1 for the assessment conducted prior to a scheduled cleanup event will be noted, but cleanups will not occur in these areas (as no trash was observed).
2. Areas in Category 2 for at least three (3) consecutive assessments conducted prior to a scheduled cleanup event will be reduced to a semi-annual or less frequent cleanup frequency. If litter increases on these parcels to a level above Category 2 as a result of the reduced cleaning frequency, the cleanups will be restored to a quarterly frequency.
3. Areas in Category 3 will be evaluated to determine if additional BMPs are needed to reduce the accumulation of trash between monitoring events. The types of trash, sources and observed trends in trash amounts will be considered in determining if modifications to the MFAC/BMP program are necessary to move the area to Category 1 or 2.
4. Areas in Category 4 for three (3) consecutive quarterly visual assessments will be targeted for more frequent patrols and/or more frequent cleanups depending on the identified primary sources of trash until the site reaches Category 1 or 2 for three consecutive visual assessment events.

Regional Board approval has been given for an interim program, summarized in the **Next Steps Section**, while details of the updated TMRP and MFAC/ BMP Program are being developed and finalized.

The following sections outline the jurisdictional BMPs currently being implemented, the additional BMPs to be implemented in prioritized areas, the BMPs being considered for implementation throughout the watershed, and a BMP implementation schedule.

CURRENT BEST MANAGEMENT PRACTICES

The TMRP listed a suite of BMPs that each responsible party was implementing in their respective jurisdictions as part of their MFAC/BMP program. Though the BMPs listed in the TMRP are still relevant, there have been several revisions and/ or additions to the suite of BMPs listed in the TMRP. Presented below, is the suite of BMPs currently being implemented by the Responsible Parties.

In addition to the BMPs presented below, the Responsible Parties contracted the CCC to conduct additional clean up events in response to the elevated trash counts from the regular MFAC Program data assessments.

City of Ventura Litter Management Program

Provided below, are non-structural BMPs the City employs annually or performed during the 2012-2013 monitoring year:

- The City sponsored several cleanup events during the 2012-2013 monitoring year, including:
    - Earth Day Beach Cleanup:
      Volunteers removed litter and other debris from Surfers' Knoll Beach in April 2013.
    - Coastal Cleanup Day:
      Volunteers removed trash and debris from Promenade Beach, Seaward Beach, San Buenaventura State Beach, Marina Park, and Ventura Harbor Beaches in September 2013.
    - Ventura Charter School Trash-a-thon:

      Student volunteers from Ventura Charter School removed trash and debris from the west Ventura area in November 2012.
- In August 2013, the City Council directed staff to draft a single-use plastic bag ban ordinance. In December 2013, Council directed staff to conduct community outreach regarding a plastic bag ban and to return to Council in the June 2014 to consider final approval of a plastic bag ban ordinance.
- The City sweeps arterial streets two to four times per month and residential areas on a monthly basis.
- The City inspects and cleans all City-maintained catch basins one to three times per year depending on the priority categorization for catch basins.
- All City catch basins are labeled with durable, all-weather placards stating, "Don't Dump – Drains to Ocean – Only Rain Down the Drain".
- The City event permit language requires event coordinators to provide litter receptacles and to clean-up litter following events.

- The City's identifies and requires corrective measures for any litter or litter sources found during commercial, industrial, and construction site inspections.
- The City collects trash from 18 public trash receptacles located within the watershed two or three times per week depending on the locations of the receptacles.

In 2012, the Ventura City Council established a work plan to eliminate encampments in the Ventura River and to implement an on-going enforcement program. The work plan included organizing stakeholder partners, conducting civic engagement, developing an action plan and corresponding follow-up steps, posting camps, conducting camp removal and launching post-camp removal strategies. The project was initiated on September 17, 2012 when the City conducted a large stakeholder meeting that included landowners, social services, public safety agencies, and maintenance staff. Since the meeting was held, over 45 camps and 100 individuals have been relocated and over 250 tons of trash and Arundo have been removed from the river bottom. Public safety meeting continue to be conducted on a quarterly and the City of Ventura's property in the estuary continues to be patrolled on a regular basis.

Provided below, are structural BMPs the City has installed since the implementation of the Trash TMDL began:

- The City has installed 150 full capture trash devices (excluders) within the watershed and conducts inspection and maintenance on these devices one to four times per year to ensure proper operation and efficiency. There are 55 catch basins that still need to be addressed via excluders.
- Completion of the installation of full capture devices at 100 percent of City-owned or City-managed conveyances discharging into the Ventura River Estuary is anticipated in June 2013.

County of Ventura and VCWPD Litter Management Program

Provided below, are non-structural BMPs the County and/ or VCWPD employs annually or performed during the 2012-2013 monitoring year:

- The County issued a contract for the installation of full capture devices on all storm drains discharging to the estuary and lower reaches of the river. Implementation of the construction contract is ongoing and anticipated to be completed by March 2014. This effort will ensure 100 percent full trash capture for County's point source discharges in Ventura River Watershed.
- The VCWPD implemented large clean up events at the VCWPD's property located above the Main St. Bridge removing 0.5 ton of trash on February 26, 2014, almost 6 tons of trash on September 26 and 28, 2013, and approximately 1 ton on October 18, 2014.
- On July 31, 2012 the County of Ventura Board of Supervisors received and filed a draft model Single-Use Bag Ordinance referred to the County by the Beach Erosion Authority for Clean Oceans and Nourishment (BEACON). The County endorsed the use of up to $8,000 as the County's pro-rata share of a regional Environmental Impact Report (EIR) to be prepared by BEACON, which is required to be completed under the California Environmental Quality Act (CEQA) before the model single-use bag ban can be adopted.

This is the first step for the County to move forward with the consideration of adoption of a single-use plastic bag ban.

- Catch basin cleaning - Catch basins are inspected at least once a year and cleaned when filled to 25 percent or more of the catch basin's capacity. During storm season, all drainage facilities are inspected and cleaned as necessary.
- Ventura County's catch basins are labeled, "Don't pollute, Flows to Waterways".
- Open channel storm drain maintenance - All VCWPD-owned and -maintained channels are cleared, inspected, and cleaned as required at least once per year.
- Trash Management at Public Events - A proper management of trash and litter plan is required when obtaining a permit for staging public events. This plan requires adequate facilities for trash collection and disposal.
- Public areas - Trash receptacles have been placed within high trash generation areas. These devices are cleaned and maintained regularly to prevent trash overflow.
- The Stormwater Quality Management Ordinance for Unincorporated Areas (Ventura County Ordinance No. 4450) includes litter and trash specific prohibitions regarding the discharge or deposition of trash that may enter the County storm drain system or receiving waters (Section 6942). The ordinance includes civil penalties for violations and provisions for issuing administrative fines, recovery of costs and misdemeanor violations.
- The County and VCWPD continue to participate in the Countywide Stormwater Program to provide outreach and education retaining the services of "The Agency", a professional advertisement group that designs and conducts Countywide, bilingual outreach programs advocating proper trash disposal. The most recent addition to the outreach program is trash prevention and protection of stormwater quality education using Facebook®. This program has had made over 7,792,614 countywide media impressions (TV, radio, internet, transit shelters) in Fall 2012, Spring 2013 and Fall 2013.
- Six new watershed awareness signs have been installed at key locations along the Ventura River, stating "Ventura River Watershed, Keep It Clean!"
- The County conducts commercial, industrial, and construction facility/ site inspections to ensure proper pollutant prevention BMPs are being applied and to educate the employees on the importance of pollution prevention.
- The County manages Foster Park, which is situated along the Ventura River, to ensure that trash originating from the park does not enter the river. Management actions include:
    - Park host and rangers removing trash and enforcing the litter ordinance.
    - Increased enforcement and collection during high trash generating events (holidays).
    - Covered trash receptacles and frequent trash pick-up and removal.

VCAILG Litter Management Program

During the 2012-2013 monitoring year, VCAILG provided 49 hours of education and outreach at 19 independent workshops to a diverse group of owners and growers throughout Ventura County. Nine workshops included education about trash BMPs for agricultural areas and information regarding the trash TMDL.

VCAILG submitted a Water Quality Management Plan in March 2013 and a revised WQMP in October 2013, which included trash-specific BMPs. The new WQMP includes a web based survey to document implemented BMPs. Two survey questions are related to trash: 1) Is the property is kept clean and free of trash, and 2) Does the property have an adequate number of trash containers that are covered and emptied regularly. Results for these survey questions will be provided in the next VCAILG WQMP due May 26, 2014.

Community Recycling & Resource Recovery, Inc. and local farmers are collaborating to recycle the agricultural plastic used to cover strawberry beds and used in some vegetable fields during growing. Community Recycling estimates that they collect approximately 70 percent of the agricultural plastic in Ventura County. The used plastic is cleaned, processed, and turned into pellets to be used in new products. Research is being done testing the use of recycled plastic in the fields and determining the percent recycled material that will still stretch and maintain the necessary strength. Collection and recycling of the plastic is an effective method for reducing plastic trash from entering the Ventura River and the Ventura River Estuary.

California State Parks

State Parks utilizes one mixed use (refuse and recycling) container to collect and dispose of trash and debris (approximately 20,000 pounds) from May to September. Camper outreach and education is implemented year-round, based on campground occupancy, and with extra efforts during the peak summer season to limit wind and wildlife trash dispersal. Additionally, river bottom patrols are conducted by law enforcement at a minimum of four times per week to discourage establishment of illegal camp sites, and river bottom trash collection is performed on a year-round basis to remove trash associated with illegal camp sites.

Ventura County Fairgrounds

Ventura County Fairgrounds implements BMPs on a schedule that varies depending on the time of the year. When the Ventura County Fair is being held at the Fairgrounds, the following BMPs are implemented daily and on an as needed basis:

- Litter pick-up in the main parking lot, the beach parking lot, and the overflow parking lot;
- Litter pick-up in the areas surrounding the event;
- Trash cans emptied;
- Recycle bins emptied; and
- Storm drains are diverted to the sewer during the Fair (July – August).

When the Ventura County Fair is not at the Fairgrounds, the above BMPs are still implemented, but on a daily, weekly, and/ or on an as needed basis depending on the specific BMP. In addition, Ventura County Fairgrounds instituted daily trash pick-up for six new trash cans placed

along the bike path near Site 3 and installed several recycling bins targeting beverage containers in the same area.

Caltrans Litter Management Program

Caltrans implements a variety of BMPs in the watershed along the freeways and highways. These BMPs are a suite of programs done to reduce trash as follows.

1. Street Sweeping
2. Trash Collection
3. Adopt-a-Highway Program.

Caltrans (District 7, serving Los Angeles and Ventura Counties) uses a variety of methods to educate the public about the importance of managing stormwater. This consists of a variety of written materials, bulletins, and websites. A few venues the District uses to accomplish this are public schools and community sponsored clean up events, Bring Your Child to Work Day, and Earth Day. The written material is designed to appeal to the public while providing technical information on selected Caltrans projects and activities. Caltrans continues to install stenciled warnings prohibiting discharges to drain inlets at park and ride lots, rest areas, vista points and other areas with pedestrian traffic.

FUTURE POTENTIAL BEST MANAGEMENT PRACTICES

It is anticipated that the homeless population within the Ventura River Estuary will continue to be a source of a majority of the trash found within the estuary. The homeless issue provides a unique challenge when trying to identify the appropriate BMPs to address trash, but the responsible parties will implement actions within their control to address the concern. Non-point source-responsible parties will begin implementing the new MFAC/ BMP Program that will address the primary source of trash through clean ups of the all parcels within the estuary. In addition, they will continue to employ the BMPs outlined above to address the areas adjacent to the estuary. Point source-responsible parties will continue to implement the required full capture devices and will inspect and maintain all installed full capture devices to ensure proper operation and effectiveness.

BEST MANAGEMENT PRACTICES IMPLEMENTATION SCHEDULE

Point source-responsible parties will continue to install the required full capture systems to meet the 100 percent installation goal and will inspect and maintain all installed full capture devices to ensure proper operation and effectiveness. Installation of full capture devices at 100 percent of the conveyances discharging to the Ventura River Estuary will be completed by 2016.

Non-point source-responsible parties will comply with the Trash TMDL through the updated MFAC/ BMP Program. The updated MFAC/ BMP Program, to be included in the updated TMRP, will be submitted in April 2014. While the new TMRP is undergoing development, Responsible Parties will implement interim activities as presented in the **Next Steps Section** below.

Next Steps

A revised TMRP presenting a detailed monitoring and reporting strategy will be submitted in April 2014. Steps for transitioning from the existing TMRP approach and MFAC/ BMP Program to the new program were approved by the Regional Board Executive Officer on October 23, 2013 and include:

1. Conduct quarterly cleanups of all Estuary parcels below Main Street.
2. Begin regular patrols by January 2014.
3. Define trash assessment program including field procedures and assessment areas.
4. Conduct assessment event by March 2014 to test the assessment process and identify the protocol and schedule for the patrols and cleanups for each parcel.
5. Submit a revised TMRP in April 2014 that includes the specific procedures for visual assessments, the schedule for cleanups, and the assessment process.
6. Implement the revised TMRP and MFAC/ BMP Program unless directed by the Regional Board staff otherwise.

Implementing the revised TMRP and MFAC/ BMP Program will eliminate the need to continue with a TMRP and MFAC/ BMP Program that is no longer consistent with the best available information for how to address trash in the Estuary. This update is necessary to improve the effectiveness of the program to more effectively assess trash levels in the Estuary, target actions towards reducing trash quantities in the Estuary and better utilize available resources.

Appendix 1. Assessment Site Descriptions

Site 1 - Lower Ventura River Estuary

This site is located below the U.S. 101 Freeway on the southwest side of the estuary. The site consists of beach areas and the open water areas of the intermittent lagoon that develops adjacent to the main water body of the Estuary.

GPS Coordinates:
Lat: 34.27697
Lon: -119.308593

Site 2 - Upper Ventura River Estuary

This site is located below the U.S. 101 Freeway on the west side of the estuary. The site consists of mud flats, open water, and emergent vegetation depending on water levels.

GPS Coordinates:
Lat: 34.278968
Lon: -119.308874

Site 3 - Sandy Beach Area between the Ocean and the Estuary

This site consists of the beach areas between the end of the estuary's main water body and the ocean as well as the rip rap along the bike path on the east side of the Estuary.

GPS Coordinates:
Lat: 34.275035
Lon: -119.308217

Site 4 - Ventura County Fairgrounds	
This site consists of the rip rap, vegetation, and portions of the estuary's main water body near where stormwater is discharged from a catch basin into the Estuary on the east side of the Ventura River and runs for approximately 100 feet. GPS Coordinates: Lat: 34.276169 Lon: -119.307505	

Site 5 - Front Street Storm Drain	
This site is located north of the train track trestle and begins at the base of the Front Street storm drain (bottom left corner of the picture) and consists of the area inside the channel as well as the vegetation along the sides of the channel and runs north-south for approximately 100 feet. GPS Coordinates: Lat: 34.277196 Lon: -119.307107	

Site 6 - Ventura River at State Freeway 33 and Shell Road	
This site consists of both banks along the Ventura River as well as the accessible portions of the river for approximately 100 feet running upstream to downstream. GPS Coordinates: Lat: 34.316625 Lon: -119.296173	

Site 7 - Ventura River at State Freeway 33 at Casitas Vista Road

This site consists of the accessible portions of the Ventura River as well as both bank areas along the river for approximately 100 feet upstream to downstream. This site also consists of the rip rap on top of the bank on the east side of the river.

GPS Coordinates:
Lat: 34.352464
Lon: -119.308071

Site 8 - Caltrans Site on State Freeway 33

This site consists of the area south of a catch basin (white pole in middle of picture) located along the west side of State Freeway 33 adjacent to the Stanley Avenue on-ramp. This site also consists of the stormwater channel connected to the catch basin on the other side of an earthen embankment to the west of the freeway. The stormwater channel receives drainage from the immediate area on the freeway and a substantial drainage area in the City of Ventura to the east.

GPS Coordinates:
Lat: 34.300807
Lon: -119.302178

DECEMBER 15, 2014

Calleguas Creek Watershed TMDL Compliance Monitoring Program

Sixth Year Annual Monitoring Report

Monitoring and Reporting Program for the Nitrogen and Related Effects; Organochlorine Pesticides, Polychlorinated Biphenyls and Siltation; Toxicity; Salts; and Metals and Selenium Total Maximum Daily Loads

submitted to:

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

prepared by:

LARRY WALKER ASSOCIATES

on behalf of the:

STAKEHOLDERS IMPLEMENTING TMDLS IN THE CALLEGUAS CREEK WATERSHED

LARRY WALKER ASSOCIATES

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Executive Summary

TOTAL MAXIMUM DAILY LOADS

There are six Total Maximum Daily Loads (TMDLs) currently effective and being implemented in the Calleguas Creek Watershed. They include:

- Nitrogen Compounds and Related Effects in Calleguas Creek (Nitrogen or Nutrients TMDL)
- Organochlorine (OC) Pesticides, Polychlorinated Biphenyls (PCBs) and Siltation in Calleguas Creek, its Tributaries, and Mugu Lagoon (OC Pesticides TMDL)
- Toxicity, Chlorpyrifos, and Diazinon in the Calleguas Creek, its Tributaries and Mugu Lagoon (Toxicity TMDL)
- Metals and Selenium in Calleguas Creek, its Tributaries, and Mugu Lagoon (Metals TMDL)
- Revolon Slough and Beardsley Wash Trash TMDL (Trash TMDL)[1]
- Boron, Chloride, Sulfate and TDS (Salts) in the Calleguas Creek, its Tributaries and Mugu Lagoon (Salts TMDL)

To address the monitoring requirements of the TMDLs, the Calleguas Creek Watershed TMDL Compliance Monitoring Program (CCWTMP) was established and a Quality Assurance Project Plan (QAPP) developed and approved by the Los Angeles Regional Water Quality Control Board (Regional Water Board) Executive Officer. The QAPP currently addresses monitoring requirements for the Nitrogen, OC Pesticides, Toxicity, and Metals TMDLs. The QAPP is being revised and will be submitted by the end of the year to incorporate the monitoring requirements for the Salts TMDL as well as recommended changes in this and previous annual monitoring reports. The Trash TMDL is addressed through a separate monitoring plan and annual monitoring report. The primary purpose of this report is to document the sixth year monitoring efforts and results of the CCWTMP for the four TMDLs currently included in the QAPP as well as the Salts TMDL.[2]

PROJECT ORGANIZATION

The CCWTMP is a coordinated effort with the various responsible parties that make up the Stakeholders Implementing TMDLs in the Calleguas Creek Watershed (Stakeholders). Stakeholders identified in the TMDLs have developed a Memorandum of Agreement (MOA) that outlines an agreement to implement the CCWTMP.

The stakeholders to the MOA for which this report fulfills the TMDL monitoring requirements are as follows:

[1] Information related to the Revolon Slough and Beardsley Wash Trash TMDL is not part of this report. The Trash TMDL annual report was submitted to the Regional Water Board on December 15, 2014.

[2] The required start of monitoring for the Salts TMDL was September 9, 2012.

- **POTWs**: consisting of Camrosa Water District, Camarillo Sanitary District, Ventura County Waterworks District No. 1, and the Cities of Simi Valley and Thousand Oaks;
- **Urban Dischargers**: consisting of the Cities of Simi Valley, Thousand Oaks, Camarillo, Moorpark and Oxnard, Ventura County Watershed Protection District, and the County of Ventura Public Works Agency;
- **Agricultural Dischargers**: consisting of the entities represented by the Ventura County Agricultural Irrigated Lands Group (VCAILG) within the Calleguas Creek Watershed, a subdivision of the Farm Bureau of Ventura County; and
- **Other Dischargers**: consisting of the U.S. Department of Navy and Caltrans.

MONITORING EVENT SUMMARIES

Sampling events required by the Nitrogen, OC Pesticides, Toxicity, and Metals TMDLs during the sixth year of TMDL monitoring included four dry-weather events (Events 39, 40, 41, and 43) and one wet weather event (Event 42). Grab samples for salts were obtained during these events, but were not used directly to determine compliance at receiving water sites.[3] Although efforts were made to sample two wet weather events, sufficient rainfall across the watershed area did not occur during the monitoring year. This is the second monitoring year during which samples from only one wet weather event were collected due to the lack of sufficient rainfall in the monitoring area. A summary of Events 39 through 43 is included in Table ES-1.

Table ES - 1. Summary of Year 6 Monitoring Events

Event	Type	Date	Mugu Lagoon			Freshwater Sites		
			Water Quality	Sediment	Tissue	Water Quality & Toxicity	Sediment Quality & Toxicity	Tissue
39	Dry	Aug 2013	X			X	X	X
40	Dry	Nov 2013	X			X		
41	Dry	Feb 2014	X			X		
42	Wet	Feb 2014	X			X		
43	Dry	May 2014	X			X		

COMPLIANCE SUMMARY

For the most part, the CCW is in compliance with the applicable interim or final WLAs and LAs currently in effect for the Nutrients, OC Pesticides, Toxicity, Salts, and Metals TMDLs. The following observations summarize the compliance status with these TMDL allocations:

- No exceedances of the interim WLAs or LAs for OC Pesticides or PCBs occurred this monitoring year.
- Exceedances of numeric targets for Nitrate-N and Nitrate-N + Nitrite-N were observed in Mugu Lagoon, Revolon Slough, Beardsley Wash, Calleguas Creek, Arroyo Las Posas,

[3] Grab samples for salts at receiving water compliance sites are used to develop statistical relationships between specific conductivity (EC) and salt constituents, which are in turn used to convert high-density EC data from continuous monitors in the field to time series of salt concentrations.

and Arroyo Simi. Most of the exceedances occurred during dry events. No exceedances of final nutrient WLAs were measured at any POTW.

- Three exceedances of the final receiving water MS4 WLAs for chlorpyrifos were measured at receiving water sites during the storm event in 2014, but not at the MS4 land use locations. However, there were no exceedances of the interim LAs. In addition, there were no exceedances of the final diazinon MS4 WLAs and interim LAs or any exceedances of the final WLAs for chlorpyrifos or diazinon at any POTW.
- Exceedances of both the interim LA and MS4 WLA for total selenium were measured at the 04_WOOD receiving water monitoring station in Revolon Slough during the four dry weather sampling events.
- Toxicity was observed at some locations in the watershed and Toxicity Identification Evaluations (TIEs) were initiated for all samples, meeting the requirements in the QAPP. As a result, the Stakeholders are in compliance with the toxicity WLAs and LAs per the requirements of the TMDL.
- In general, receiving water sites were in compliance with interim LAs and MS4 WLAs established by the Salts TMDL; the only exception being exceedances in total dissolved solids, sulfate, and boron measured at 04_WOOD in the Revolon Slough watershed. POTWs are in compliance with interim salts WLAs, with the exception of the Camarillo Water Reclamation Plant (WRP), which experienced exceedances of chloride, sulfate, and TDS. The exceedances of interim salts WLAs for the Camarillo WRP have resulted from increased influent salt concentrations due to water conservation and a shift in the composition of the water supplied within the service area. Since the process for addressing salts is a watershed effort involving significant capital investments, the Camarillo WRP has received a time schedule order to adjust the interim limits for TDS and sulfate. During the period of this annual report, application of interim limits for chloride was stayed by State Board Order 2003-0019. As a result, the interim limits in the TMDL are not the currently applicable interim limits for the Camarillo WRP discharge.

MONITORING PROGRAM CHANGES

The QAPP is currently being updated to incorporate the Salts TMDL monitoring approach. At this time the QAPP will be updated for all constituents to reflect the recommendations identified in prior annual reports and reflect monitoring adjustments that have been implemented due to field conditions. The revised QAPP will be submitted to the Los Angeles Regional Water Quality Control Board by the end of 2014.

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Introduction and Program Background

INTRODUCTION

In the Calleguas Creek Watershed (CCW), the following six total maximum daily loads (TMDLs) are currently effective and include monitoring requirements in the implementation plans:

- Nitrogen Compounds and Related Effects in Calleguas Creek (Nitrogen or Nutrients TMDL)
- Organochlorine (OC) Pesticides, Polychlorinated Biphenyls (PCBs) and Siltation in Calleguas Creek, its Tributaries, and Mugu Lagoon (OC Pesticides TMDL)
- Toxicity, Chlorpyrifos, and Diazinon in the Calleguas Creek, its Tributaries and Mugu Lagoon (Toxicity TMDL)
- Metals and Selenium in Calleguas Creek, Its Tributaries, and Mugu Lagoon (Metals TMDL)
- Revolon Slough and Beardsley Wash Trash TMDL (Trash TMDL) [1]
- Boron, Chloride, Sulfate and TDS (Salts) in the Calleguas Creek, its Tributaries and Mugu Lagoon (Salts TMDL)

To address the monitoring requirements of the TMDLs, the Calleguas Creek Watershed TMDL Compliance Monitoring Program (CCWTMP) was established and a Quality Assurance Project Plan (QAPP) developed and approved by the Los Angeles Regional Water Quality Control Board (Regional Water Board) Executive Officer. The QAPP currently addresses monitoring requirements for the Nitrogen, OC Pesticides, Toxicity, and Metals TMDLs only. The Trash TMDL is addressed through a separate monitoring plan and annual monitoring report.

The QAPP is being revised to incorporate the monitoring requirements for the Salts TMDL. A monitoring approach (Salts Plan) for the Salts TMDL was submitted by the Stakeholders Implementing TMDLs in the Calleguas Creek Watershed (Stakeholders) to the Regional Water Board in June 2009, which was conditionally approved in September 2011. Compliance monitoring for the Salts TMDL was required starting September 9, 2012.

The primary purpose of this report is to document the sixth year monitoring efforts (July 2013 to June 2014) and results of the CCWTMP for the four TMDLs currently included in the QAPP and the second year of compliance monitoring for the Salts TMDL. The report includes summaries of the sampling events, data summaries, trends analysis, and a compliance assessment. The report is divided into the following sections:

- Introduction and Program Background
- Monitoring Program Structure
- Monitoring Data Summary
- Data Trends

[1] Information related to the Revolon Slough and Beardsley Wash Trash TMDL is not part of this report. The Trash TMDL annual report will be submitted to the Regional Water Board on December 15, 2014.

- Compliance Analysis and Discussion
- Revisions and Recommendations

In addition, there are several appendices included with this report and several attachments (electronic data files) associated with this report, including:

- Appendices (text documents)
    - Appendix A: Monitoring Event Summaries for Toxicity, OC Pesticides, Nutrients, Metals, and Salts TMDLs
    - Appendix B: Calibration Event Summary for Salts TMDL
    - Appendix C: Salts Rating Curves and Surrogate Relationships
    - Appendix D: Toxicity Testing and Toxicity Identification Evaluations Summary
    - Appendix E: Laboratory Quality Assurance/Quality Control Results and Discussion
- Attachments (electronic data files)
    - Attachment 1: Toxicity Data
    - Attachment 2: Monitoring Data
    - Attachment 3: Salts Mean Daily Flows: July 2013 to June 2014
    - Attachment 4: Chain-of-Custody Forms

PROJECT ORGANIZATION

The CCWTMP is a coordinated effort where the various responsible parties identified in the TMDLs have developed a Memorandum of Agreement (MOA) that outlines an agreement to implement the CCWTMP. The responsible parties identified in the organizational structure have formally joined together to fulfill their monitoring requirements as outlined in the Basin Plan Amendments (BPAs) for the four TMDLs included in the QAPP and Salts.

The CCWTMP is intended to fulfill the monitoring requirements for only those stakeholders that are part of the MOA and/or identified by the participants of the MOA. The stakeholders to the MOA for which this report fulfills the TMDL monitoring requirements are as follows:

- **POTWs**: consisting of Camrosa Water District, Camarillo Sanitary District, Ventura County Waterworks District No. 1, and the Cities of Simi Valley and Thousand Oaks;
- **Urban Dischargers**: consisting of the Cities of Simi Valley, Thousand Oaks, Camarillo, Moorpark and Oxnard, Ventura County Watershed Protection District, and the County of Ventura Public Works Agency;
- **Agricultural Dischargers**: consisting of the entities represented by the Ventura County Agricultural Irrigated Lands Group (VCAILG) within the Calleguas Creek Watershed, a subdivision of the Farm Bureau of Ventura County; and
- **Other Dischargers**: consisting of the U.S. Department of the Navy and the California Department of Transportation (Caltrans).

Per the MOA, a Management Committee, consisting of one representative each from the POTWs, Urban Dischargers and Other Dischargers groups, and two representatives from the Agricultural Dischargers group, oversees the CCWTMP and makes decisions to assure the CCWTMP is carried out in a timely, accountable fashion.

Prior to the initiation of the first required sampling event in 2008, the Stakeholders contracted the day-to-day management of the CCWTMP activities and field sampling activities. The following contractors performed the following tasks during the sixth year monitoring effort:

- **General Project Management** - Larry Walker Associates, Inc. (LWA)
- **Field Monitoring Activities**
    - **Mugu Lagoon Water Quality Sampling** - MBC Applied Environmental Sciences (MBC)
    - **Freshwater Water Quality/Sediment Sampling** - Kinnetic Laboratories, Inc. (KLI), Fugro West, Inc. (Fugro), LWA
    - **Freshwater Fish Tissue** – Cardno ENTRIX
    - **Bird Egg Collection** – Naval Base Ventura County Environmental Staff
- **Water, Sediment, and Tissue Chemistry Analysis** - Physis Environmental Laboratories, Inc. (Physis)
- **Salts Chemistry Analysis** - Fruit Growers Laboratory, Inc. (FGL) and Physis
- **Toxicity Analysis** - Pacific Eco Risk Laboratories (PacEco)

The aforementioned contractors performed all the management activities and sampling efforts covered by this annual report. All field contractors are the same as used in last year's sampling efforts. As the monitoring program moves forward this list of contractors may continue to be amended to reflect new contractors hired on to perform required or new duties per the decision of the Stakeholders in the CCW.

WATERSHED BACKGROUND

Calleguas Creek drains an area of approximately 343 square miles from the Santa Susana Pass in the east to Mugu Lagoon in the southwest. The main surface water system drains from the mountains in the northeast part of the watershed toward the southwest where it flows through the Oxnard Plain before emptying into the Pacific Ocean through Mugu Lagoon. The watershed, which is elongated along an east-west axis, is approximately thirty miles long and fourteen miles wide. The Santa Susana Mountains, South Mountain, and Oak Ridge form the northern boundary of the watershed; the southern boundary is formed by the Simi Hills and Santa Monica Mountains. Figure 1 depicts the CCW and Table 1 presents the reaches of the CCW as identified in the TMDLs covered by the CCWTMP.

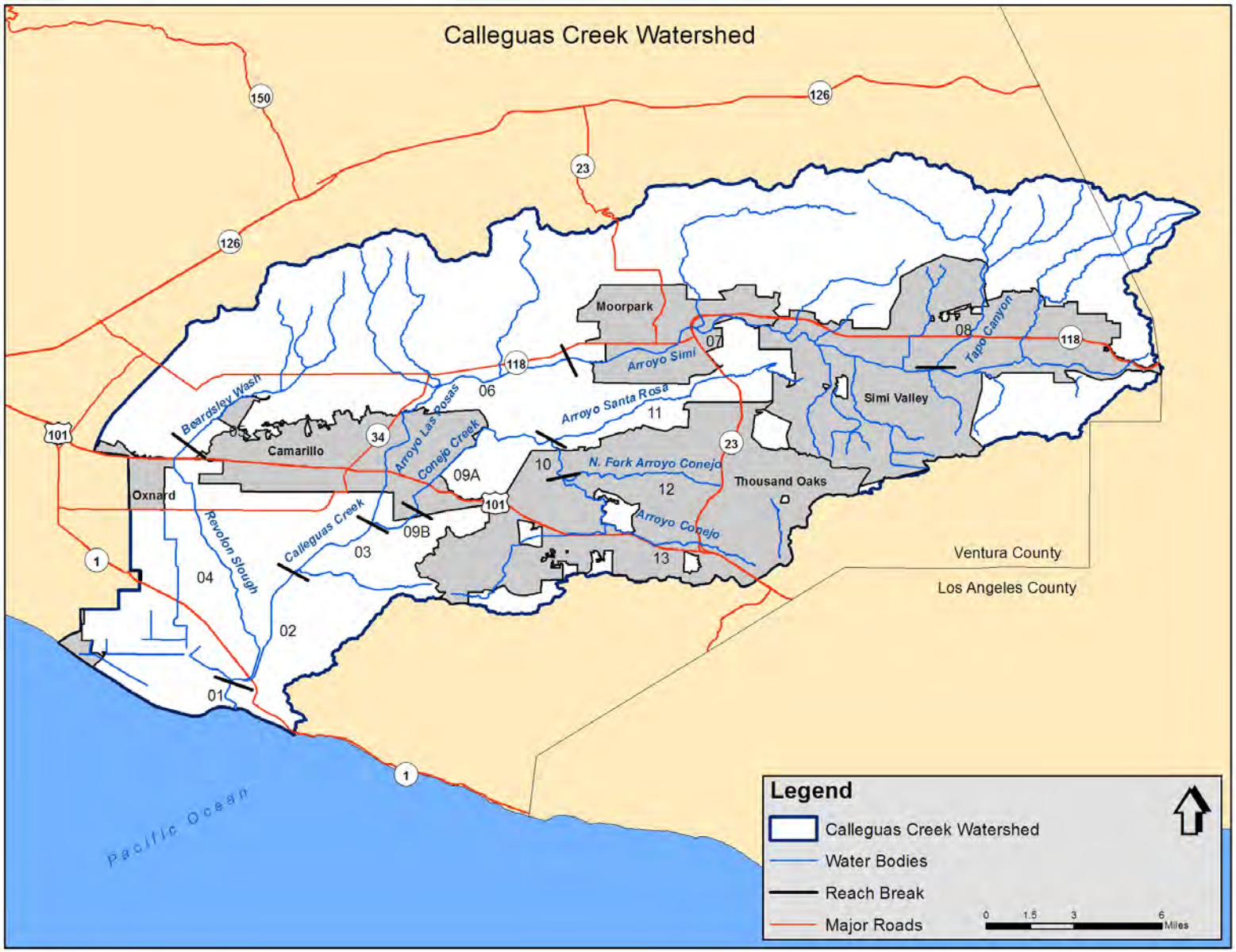


Figure 1. Calleguas Creek Watershed

Table 1. Description of Calleguas Creek Watershed Reaches

Reach No.	Reach Name	Subwatershed	Geographic Description
1	Mugu Lagoon	Mugu	Lagoon fed by Calleguas Creek
2	Calleguas Creek (Estuary to Potrero Rd.)	Calleguas	Downstream (south) of Potrero Rd
3	Calleguas Creek (Potrero Rd. to Conejo Creek)	Calleguas	Potrero Rd. upstream to confluence with Conejo Creek
4	Revolon Slough	Revolon	Revolon Slough from confluence with Calleguas Creek to Central Ave
5	Beardsley Channel	Revolon	Revolon Slough upstream of Central Ave.
6	Arroyo Las Posas	Las Posas	Confluence with Calleguas Creek to Hitch Road
7	Arroyo Simi	Arroyo Simi	End of Arroyo Las Posas (Hitch Rd) to headwaters in Simi Valley.
8	Tapo Canyon Creek	Arroyo Simi	Confluence w/ Arroyo Simi up Tapo Canyon to headwaters
9B [1]	Conejo Creek (Camrosa Diversion to Arroyo Santa Rosa)	Conejo	Extends from the confluence with Arroyo Santa Rosa downstream to the Conejo Creek Diversion.
9A [1]	Conejo Creek (Calleguas Creek to Camrosa Diversion)	Conejo	Extends from Conejo Creek Diversion to confluence with Calleguas Creek.
10	Hill Canyon reach of Conejo Creek	Conejo	Confluence with Arroyo Santa Rosa to confluence with N. Fork; and N. Fork to just above Hill Canyon WTP
11	Arroyo Santa Rosa	Conejo	Confluence with Conejo Creek to headwaters
12	North Fork Conejo Creek	Conejo	Confluence with Conejo Creek to headwaters
13	Arroyo Conejo (South Fork Conejo Creek)	Conejo	Confluence with N. Fork to headwaters —two channels

1. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched.

MONITORING QUESTIONS

The purpose of the CCWTMP is to direct the monitoring activities conducted to meet the requirements of the TMDLs effective for the CCW, excluding the Trash TMDL. The goals of the CCWTMP include:

- To determine compliance with numeric targets, waste load and load allocations, and interim load reduction milestones.
- To test for sediment toxicity at sediment monitoring stations.
- To identify causes of unknown toxicity.
- To generate additional land use runoff data to better understand pollutant sources and proportional contributions from various land use types.

- To monitor the effect of implementation actions by urban, POTW, and agricultural dischargers on in-stream water, sediment, fish tissue quality, and watershed balances (salts).
- To implement the program consistent with other regulatory actions within the CCW.

The CCWTMP is intended to answer the following monitoring questions to meet the goals of the program:

- Are numeric targets and allocations met at the locations indicated in the TMDLs?
- Are conditions improving?
- What is the contribution of constituents of concern from various land use types?

MONITORING PROGRAM DESCRIPTION

The CCWTMP was developed to address all necessary TMDL monitoring requirements and answer the monitoring questions mentioned previously using the following monitoring elements.

Required Monitoring Elements

The following environmental monitoring elements are required by the TMDLs' BPAs and are included in the CCWTMP:

- General water and sediment quality constituents;
- Water column and sediment toxicity;
- Metals and selenium in water, sediment, fish tissue, and bird eggs;
- Organic compounds in water, sediment, and fish tissue; and,
- Nitrogen and phosphorus compounds in water.
- Continuous salt concentrations and flow (the latter only at Salts TMDL receiving water compliance sites)

Table 2 lists the constituents for which analyses are conducted. Table 2 also provides a summary of sampled constituent groups and sampling frequency. The QAPP outlines, in detail, the justification of the process design, specific methodologies (both field and analytical), and quality assurance/quality control (QA/QC) procedures.

Table 2. Constituents and Monitoring Frequency for CCWTMP (varies by site)

Constituent	Frequency
Chronic Aquatic Toxicity	Quarterly + Two wet events
General Water Quality Constituents (GWQC)	Quarterly based on location + Two wet events
Flow, pH, Temperature, Dissolved Oxygen, Conductivity, Total Suspended Solids (TSS), Hardness (at freshwater sites where metals samples are collected), and Dissolved Organic Carbon (at saltwater sites where metals samples are collected)	
Nutrients	Quarterly
Ammonia Nitrogen, Nitrate Nitrogen, Nitrite Nitrogen, Organic Nitrogen, Total Kjehdahl Nitrogen (TKN), Total Phosphorus, Orthophosphate-P	
Organic Constituents In Water	Quarterly + Two wet events
OC Pesticides [1] and PCBs [2], OP [3], Triazine [4], and Pyrethroid [5] Pesticides	
Metals and Selenium In Water [6]	Quarterly + Two wet events [7]
Copper, Mercury, Nickel, Zinc, and Selenium [8]	
Salts	
Electrical Conductivity (EC) and Discharge	Receiving water: Continuous (via in-situ sensors for EC and depth) plus monthly grabs for EC and discharge for sensor calibration
Total Dissolved Solids (TDS), Sulfate, Chloride, Boron	Receiving water: Continuous (derived from EC/salt relationships) Other sites: Quarterly + Two wet events
Chronic Sediment Toxicity	Annually (Every three years in Lagoon)
General Sediment Quality Constituents (GSQC)	Annually (Every three years in Lagoon)
Total Ammonia, Percent Moisture, Grain Size Analysis, Total Organic Carbon (TOC)	
Organic Constituents In Sediment	Annually (Every three years in Lagoon)
OC Pesticides[1] and PCBs[2], OP Pesticides[3], and Pyrethroids[5]	

Table 2. Constituents and Monitoring Frequency for CCWTMP (varies by site) - continued

Additional Constituents For Mugu Lagoon Sediment	Every three years
Metals[9]	
Tissue	Annually (Every three years in Lagoon)
Percent Lipids, OC Pesticides[1] and PCBs[10], OP Pesticides[3], and Metals[11]	

1. OC Pesticides considered: aldrin, alpha-BHC, beta-BHC, gamma-BHC (lindane), delta-BHC, chlordane-alpha, chlordane-gamma, 2,4'-DDD, 2,4'-DDE, 2,4'-DDT, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin, endosulfan I and II, endosulfan sulfate, endrin, endrin aldehyde, endrin ketone, and toxaphene
2. PCBs in water and sediment considered: Aroclors identified in the CTR (1016, 1221, 1232, 1242, 1248, 1254, and 1260).
3. OP Pesticides considered: chlorpyrifos, diazinon, and malathion. Chlorpyrifos is the only OP pesticide that will be measured in tissue, as it is the only OP listed in tissue.
4. Triazine Pesticides considered: atrazine, prometryn, and simazine. Analysis of triazines ceased during year 3 following the recommendation being included in the Revisions and Recommendations section of both the year 1 and year 2 annual reports.
5. Pyrethroid Pesticides considered: bifenthrin, cyfluthrin, cypermethrin, deltamethrin, and permethrin
6. Copper, mercury, nickel, selenium and zinc will be measured as dissolved and total recoverable.
7. Per the Metals TMDL BPA requires that "In-stream water column samples will be collected monthly for analysis of general water quality constituents (GWQC) and, copper, mercury, nickel, selenium, and zinc for the first year. After the first year, the Executive Officer will review the monitoring report and revise the monitoring frequency as appropriate." Monthly monitoring will be suspended until such time as the Executive Officer has reviewed the monitoring report and considered revisions to the monitoring frequency. Until the Executive Officer has considered the frequency, metals will be collected quarterly in conjunction with the other TMDLs.
8. Monitoring at sites in Mugu Lagoon other than at the Ronald Reagan Bridge for metals is an optional element.
9. Includes arsenic, cadmium, copper, lead, mercury, nickel, selenium and zinc. Arsenic, lead, and cadmium are included in addition to constituents required in the Metals TMDL as they have been found in previous sediment studies conducted in Mugu Lagoon to exceed guideline values used to interpret the relationship between sediment chemistry and biological impacts.
10. PCBs in tissue considered: individual congers.
11. Mercury and Selenium will be measured in fish tissue and bird eggs.

Optional Monitoring Elements

The QAPP outlines the optional monitoring efforts, all of which are considered above and beyond what is necessary to meet the requirements of the BPAs and answer the monitoring questions.

Table 3 lists the constituents and analyses that are considered optional for the CCWTMP. Monitoring for the constituents and conducting the analyses are not BPA requirements but are important to meeting general program goals and answering program questions. Table 3 also provides a general sampling frequency for each constituent group.

Table 3. Optional Constituents and Monitoring Frequency for CCWTMP (varies by site)

Constituent	Frequency
Organic Constituents in Water – Grain Size Fractions [1]	One wet event annually
OC Pesticides and PCBs, OP, Triazine [2], and Pyrethroid Pesticides	
Organic Constituents in Sediment – Grain Size Fractions [1]	Annually (Every three years in Mugu Lagoon)
OC Pesticides and PCBs, OP, Triazine [2], and Pyrethroid Pesticides	
Additional Constituents for Mugu Lagoon Sediment	Every three years [3]
Macrobenthic community assessment	
Sediment Toxicity – Embryo *Mytilus edulis* or *Crassostrea gigas*	

1. Please see Table 2 for a list of individual constituents in each suite.
2. Analysis of triazines ceased during year three following the recommendation being included in the Revisions and Recommendations section of both the year one and year two annual reports.
3. Mugu Lagoon assessments were conducted during the first and fourth years of monitoring.

Special Studies

The Nitrogen, Toxicity, OC Pesticides, Salts, and Metals TMDL Implementation Plans identify required and optional special studies to investigate a range of issues. No specific special studies results are incorporated into this annual report summary at this time as the results of all special studies conducted to date have been submitted as separate reports. Data gathered during special study specific sampling may also be utilized to further answer not only the special studies questions, but also be applied to the overall CCWTMP goals and questions identified previously in this report.

Monitoring Program Structure

As outlined previously, the CCWTMP covers a broad range of TMDL monitoring requirements, including both required and optional efforts. The overall structure of these requirements per each event can be broken down into two categories: (1) compliance monitoring and (2) investigation monitoring. Compliance monitoring sites are typically located in receiving water bodies where 303(d) listings occur, and are considered points of compliance measurements. The investigational sites are located throughout the watershed, and include monitoring of drain outfalls. The purpose of these sites is not to measure compliance, but to assist with evaluating land use specific contributions of various constituents to the watershed.

The CCWTMP effort is also divided into two monitoring efforts: (1) required dry weather monitoring and (2) wet weather storm water monitoring. The following sections describe, in detail, the basis for each monitoring effort, starting with the definitions of the compliance monitoring sites and investigation monitoring sites. Specific monitoring efforts associated with each sample site are included, including the frequency of sampling by site for both dry weather and wet weather events. The sampling frequency and the constituents monitored for at the sites covered by the CCWTMP vary. A more detailed description of each topic covered can be found in the appropriate element of the QAPP, including standard operating procedures (SOPs) for field collection and sample handing techniques, and analytical procedures and protocols including minimum detection limit (MDL) and reporting limit (RL) requirements.

COMPLIANCE MONITORING

Compliance Monitoring for Toxicity, OC Pesticides, Metals, Nitrogen, and Salts TMDLs

For compliance monitoring to address the Toxicity, OC Pesticides, Metals and Nitrogen TMDLs, dry weather in-stream water column samples were collected quarterly for water column toxicity, general water quality constituents (GWQC), target organic constituents, metals, and nutrients. Target organic constituents for the OC Pesticides TMDL include the OC Pesticides and PCBs listed as a footnote in Table 2. Target organic constituents for the Toxicity TMDL include the OP and pyrethroid pesticides listed as a footnote in Table 2. Target metals for the Metals and Selenium TMDL are listed as a footnote in Table 2.

In-stream water column samples to measure compliance for the Toxicity, OC Pesticides, and Metals TMDLs are generally collected at the base of each of the subwatersheds used to assign waste load and load allocations, per the BPAs.[1] In-stream water column samples to measure compliance for the Nitrogen TMDL are generally collected at the base of each listed reach. Toxicity Identification Evaluations (TIEs) are conducted on toxic samples as outlined in the Toxicity Testing and TIE section of the QAPP and results of these are discussed in the Toxicity Testing and TIE Evaluations Summary section of this report.

In-stream water column grab samples for salts were also collected quarterly during dry weather and once during wet weather at the base of each of the subwatersheds specified in the Salts

[1] The QAPP includes an optional metals monitoring element to monitor additional sites in Mugu Lagoon.

TMDL.[2] The grab sample results are used to develop statistical relationships between salt constituents and EC. These relationships are used to convert high frequency EC-sensor data to time-series of salt concentrations. Compliance with interim dry weather salt allocations is determined using monthly mean salt concentrations for dry weather developed from the time-series of data.

Additionally, POTW effluent was monitored for compliance with the effluent limits presented in the Toxicity, OC Pesticides, Metals, and Salts TMDL BPAs. Currently, POTWs collect data required by each of their individual monitoring requirements. For additional TMDL constituents not currently sampled by the plants, CCWTMP crews perform sampling as necessary (efforts vary by plant and constituent group). All CCWTMP-required data for POTWs are compiled in this report.

All efforts were made to include two wet weather water sampling events for compliance monitoring for the OC Pesticides, Toxicity, Metals, and Salts TMDLs during targeted storm events between October and April. Due to the unusually dry conditions during the monitoring year, only one storm event was captured.

Streambed sediment samples, collected annually in the freshwater portion of the watershed, were collected during the first event of this monitoring year and analyzed for sediment toxicity, general sediment quality constituents (GSQC), and target organics. Sediment samples in Mugu Lagoon are only to be collected every three years per the approved QAPP. Samples were collected and reported in years one and four; the next sediment sampling in Mugu Lagoon will take place in year seven.

Similar to the sediment sampling frequency, fish tissue samples were collected in the freshwater portions of the watershed in August 2013, and will continue to be collected annually for the CCWTMP. Fish tissue and mussel samples were collected in Mugu Lagoon during the first and fourth years of monitoring and will continue to be collected every three years.

INVESTIGATION MONITORING

Investigation monitoring focuses on identifying the contribution of constituents of concern from various land uses in the watershed and areas where toxicity has been observed to occur in the past that are not addressed by compliance monitoring. These sites are meant to compliment compliance monitoring efforts, fill data gaps where identified, and assist in identification of sources of constituents that may be leading to non-compliant conditions. The following describes the various types of investigation sites sampled during this reporting period.

Land Use Discharge Investigation

Land use discharge samples are generally collected concurrently (on the same day when possible) with compliance monitoring at representative agricultural and urban discharge sites generally located in each of the subwatersheds and analyzed for selected GWQC, metals, and target organic constituents (constituents monitored per site varies based upon sub-watershed).

[2] The goal is to sample two wet weather events per monitoring year; however, only one storm was predicted that met the thresholds for monitoring.

Toxicity Investigation

As significant mortality had not occurred at the two sediment toxicity investigation sites during the first three years of the CCWTMP, ceasing investigation monitoring was recommended in the third year annual report. Toxicity testing at the investigation sites ceased until event 38, when it was resumed to support delisting of the identified reaches. Sediment toxicity investigation monitoring for delisting did not take place during year six sampling. However, the year-six samples were analyzed for a suite of constituents (general chemistry, general nutrients, metals, PCBs, OC pesticides, OP pesticides, and pyrethroid pesticides), particle size distribution, and total organic carbon.

Water column toxicity sampling for year six occurred during four events for each of the two investigation sites. However, toxicity testing could not be completed for Event 41 due to a laboratory issue with the test organisms. The normal annual sampling frequency for this investigation is provided in Table 6.

SAMPLING SITES

The QAPP details the justification and rationale for each of the sites sampled via the CCWTMP. Information on compliance monitoring sites, land use sites, and sample collection frequency is presented in Table 4 and Table 5. The general locations of the receiving water compliance monitoring sites (excluding Mugu Lagoon) for water, sediment, and fish tissue are presented in Figure 2 through Figure 4. The POTW effluent discharge sites are presented in Figure 5. The sampling sites in each figure are designated by sampled constituent group. The compliance monitoring sampling zones for sediment sampling and tissue sampling in Mugu Lagoon are shown in Figure 6 and Figure 7, respectively.

The non-Mugu Lagoon water and sediment toxicity investigation sampling sites coincide with current and previous sampling programs in the CCW. Water and sediment toxicity investigation sampling sites and sampling frequency are presented in Table 6, while the general locations of the water and sediment toxicity investigation sampling sites in the CCW are presented in Figure 8. Land use monitoring sites are shown in Figure 9.

The salt monitoring sites correspond with compliance sites or land use sites already included in the QAPP for monitoring related to other TMDLs (Figure 2) with two exceptions:

1. One of the salt compliance points is only used for salt monitoring (Conejo Creek at Baron Brothers Nursery), and thus is not currently described in the QAPP.
2. The continuous monitoring equipment (and the location of salt grab samples) for the Simi subwatershed was installed just downstream of the Tierra Rejada bridge, and is referred to as “07_TIERRA”.

The CCWTMP efforts summarized in the annual report correspond to the sites and locations listed below. As this program progresses, the number and location of sites may be revised if existing sites become inaccessible, if it is determined that alternative locations are needed, or if the number of land use stations needed to appropriately characterize discharges needs modification.

Table 4. CCWTMP Compliance Monitoring and Nutrient Investigation Sites Annual Sampling Frequency

Sub-Wat.	Site Id	Reach	Site Location	GPS Coordinates		Water [1, 2]						Sediment			Tissue [3]	
				Lat	Long	Tox	Pests/ PCBs	Nut	Metal	Salts	GWQC	Tox	Pests /PCBs	Metal	Pests/ PCBs	Metal [4]
Mugu Lagoon	01_RR_BR	1	Ronald Reagan St Bridge	34.1090	-119.0916	6	6	6	6	NA	6	NA	NA	NA	NA	NA
	01_BPT_3	1	Located In Eastern Arm	General site locations are provided as each site represents a generalized sample collection zone in which a sample will be collected.		NA	NA	NA	NA	NA	NA	Once Every Three Years				
	01_BPT_6	1	Located In Eastern Part Of Western Arm			NA	NA	NA	NA	NA	NA					
	01_BPT_14	1	Located In The Central Part Of The Western Arm			NA	NA	NA	NA	NA	NA					
	01_BPT_15	1	Located Between Estuary and Mouth of Lagoon			NA	NA	NA	NA	NA	NA					
	01_SG_74	1	Located In Western Part of Central Lagoon			NA	NA	NA	NA	NA	NA					
	Central Lagoon	1	Sampled In Central Lagoon			NA	NA	NA	NA	NA	NA				Once Every Three Years	
	Western Arm	1	Sampled In Western Arm Of The Lagoon			NA	NA	NA	NA	NA	NA					
Revolon Slough	04_WOOD [5]	4	Revolon Slough East Side Of Wood Road	34.1698	-119.0958	6	6	6	6	6	6	1	1	NA	1	1
	05_CENTR	5	Beardsley Wash at Central Avenue	34.2300	-119.1128	NA	NA	6	NA	NA	6	NA	NA	NA	NA	NA
Calleguas	02_PCH	2	Calleguas Creek NE Side of Hwy 1 Bridge	34.1119	-119.0818	NA	NA	4	NA	NA	4	NA	NA	NA	NA	NA
	03_UNIV	3	Calleguas Creek At Camarillo Street	34.1795	-119.0399	6	6	6	6	6	6	1	1	NA	1	NA
	03D_CAMR [6]	3	Camrosa Water Reclamation Plant	34.1679	-119.0530	4	4	4	4	4	4	NA	NA	NA	NA	NA
	9A_HOWAR [7]	9B [7]	Conejo Creek At Howard Road Bridge	34.1931	-119.0025	NA	NA	6	NA	6	NA	NA	NA	NA	NA	NA
	9AD_CAMA [7]	9B [7]	Camarillo Water Reclamation Plant	34.1938	-119.0017	4	4	4	4	4	4	NA	NA	NA	NA	NA
Conejo	9B_ADOLF [7]	9A [7]	Conejo Creek At Adolfo Road	34.2137	-118.9894	6	6	6	NA	NA	6	NA	1	NA	1	NA

Sub-Wat.	Site Id	Reach	Site Location	GPS Coordinates		Water [1, 2]						Sediment			Tissue [3]	
				Lat	Long	Tox	Pests/ PCBs	Nut	Metal	Salts	GWQC	Tox	Pests /PCBs	Metal	Pests/ PCBs	Metal [4]
Conejo	10_GATE	10	Conejo Creek Hill Canyon Below N Fork	34.2178	-118.9281	NA	NA	6	NA	NA	6	NA	NA	NA	NA	NA
	10D_HILL	10	Hill Canyon Wastewater Treatment Plant	34.2113	-118.9218	4	4	4	4	4	4	NA	NA	NA	NA	NA
	12_PARK	12	Conejo Creek North Fork above Hill Canyon	34.2144	-118.915	NA	NA	4	NA	NA	4	NA	NA	NA	NA	NA
	13_BELT	13	Conejo Creek S Fork Behind Belt Press Building	34.2078	-118.9194	NA	NA	4	NA	NA	4	NA	NA	NA	NA	NA
	9B_BARON [7]	9A [7]	Conejo Creek at Baron Brothers Nursery	34.2365	-118.9643	NA	NA	NA	NA	6	NA	NA	NA	NA	NA	NA
Las Posas	06_SOMIS	6	Arroyo Las Posas Off Somis Road	34.2540	-118.9925	6	6	6	NA	NA	6	NA	1	NA	1	NA
	06D_MOOR [6]	6	Ventura County Wastewater Treatment Plant	34.2697	-118.9357	4	4	4	4	4	4	NA	NA	NA	NA	NA
Arroyo Simi	07_HITCH	7	Arroyo Simi East Of Hitch Boulevard	34.2716	-118.9234	6	6	6	NA	NA	6	NA	1	NA	1	NA
	07_TIERRA	7	Arroyo Simi downstream from Tierra Rejada Blvd.	34.2701	-118.9058	NA	NA	NA	NA	6	NA	NA	NA	NA	NA	NA
	07_MADER	7	Arroyo Simi at Madera Ave.	34.2778	-118.7958	NA	NA	6	NA	NA	6	NA	NA	NA	NA	NA
	07D_SIMI	7	Simi Valley Water Quality Control Plant	34.2848	-118.8128	4	4	4	4	4	4	NA	NA	NA	NA	NA

NA – Not Analyzed

Tox – Samples will be analyzed for toxicity and OP and pyrethroid pesticides as listed in Table 2. Toxicity in water will not be analyzed at 01_RR_BR or at the POTWs.

Pests/PCBs – Samples will be analyzed for OC pesticides and PCBs as listed in Table 2. Chlorpyrifos will be analyzed in tissue at 04_WOOD as it is on the 303(d) list for this reach.

Nut – Samples will be analyzed for Nutrients as listed in Table 2.

Metal – Samples will be analyzed for Metals as listed in Table 2.

GWQC – Samples will be analyzed for General Water Quality Constituents as listed in Table 2.

1. Sites listed for 6 sampling events per monitoring year refers to 4 quarterly dry events and the attempt to sample 2 additional wet events..
2. Grab samples for salts at compliance sites are not directly used to determine compliance with salts WQOs, but are used to develop statistical relationships between EC and salt constituents (Appendix C).
3. Tissue samples will be collected in the same location as water and sediment samples. Samples may be collected elsewhere if no fish are found at pre-established sample stations.
4. Bird egg samples will be collected and analyzed for mercury and selenium in the Mugu Lagoon subwatershed.
5. TIEs will not be performed at 04_WOOD.
6. The Camrosa Water Reclamation Plant and the Ventura County Wastewater Treatment Plant are not currently discharging. However, these sites are included in case they must be sampled at a later date.
7. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and historic site naming conventions, the site names in the annual monitoring reports maintain the original reach designations.

Table 5. CCWTMP Land Use Monitoring Sites and Sample Frequency

Sub-Wat.	Site ID	Reach	Site Type [1]	Site Location	GPS Coordinates		Pests/ PCBs	Nutrients	Metal	Salts	GWQC
					Lat	Long					
Mugu Lagoon	01T_ODD2_DCH	1	Ag	Duck Pond/Mugu/Oxnard Drain #2 S. of Hueneme Rd	34.1395	-119.1185	6	6	6	NA	6
Revolon Slough	04D_WOOD	4	Ag	Agricultural Drain on E. Side of Wood Rd N. of Revolon	34.1708	-119.0963	6	6	6	6	6
	05D_SANT_ VCWPD	5	Ag	Santa Clara Drain at VCWPD Gage 781 prior to confluence with Beardsley Channel	34.2426	-119.1137	6	6	6	NA	6
	04D_VENTURA	4	Urban	Camarilo Hills Drain at Ventura Blvd and Las Posas Rd at VCWPD Gage 835	34.2162	-119.0685	6	NA	6	6	6
Calleguas	02D_BROOM	2	Ag	Discharge to Calleguas Creek at Broome Ranch Rd.	34.1433	-119.0713	6	6	6	NA	6
Conejo	9BD_GERRY [2]	9A [2]	Ag	Drainage ditch crossing Santa Rosa Rd at Gerry Rd	34.2358	-118.9446	6	6	6	6	6
	9BD_ADOLF [2]	9A [2]	Urban	Urban storm drain passing under N. side of Adolfo Rd approximately 300 meters from Reach 9B	34.2148	-118.9951	6	NA	6	6	6
	13_SB_HILL	13	Urban	South Branch Arroyo Conejo on S. Side of W Hillcrest	34.1849	-118.9075	6	NA	NA	6	6
Las Posas	06T_FC_BR	6	Ag	Fox Canyon at Bradley Rd - just north of Hwy 118	34.2646	-119.0111	6	6	NA	NA	6
Arroyo Simi	07D_HITCH_ LEVEE_2	7	Ag	2nd corrugated pipe discharging on north side of Arroyo Simi flood control levee off of Hitch Blvd just beyond 1st power pole.	34.2716	-118.9219	6	6	NA	6	6
	07D_CTP	7	Urban	Flood control channel in Country Trail Park	34.2646	-118.9075	6	NA	NA	6	6
	07T_DC_H	7	Urban	Dry Canyon at Heywood Street	34.2683	-118.7600	6	NA	NA	NA	6

Ag = Agricultural Land Use Site Urban = Urban Land Use Site NA – Not Analyzed

1. Specific constituents analyzed under each category are listed in Table 2.
2. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and historic site naming conventions, the site names in the annual monitoring reports maintain the original reach designations.

Table 6. Toxicity Investigation Monitoring Sites and Sampling Frequency

Subwatershed	Site ID	Reach	Site Location	GPS Coordinates		Tox	Pests/PCBs	GWQC
				Lat	Long			
Sediment Toxicity Investigation [1]								
Calleguas	02_PCH	2	Calleguas Creek Northeast Side Of Highway 1 Bridge	34.1119	-119.0818	1	1	1
	9A_HOWAR [2]	9B [2]	Conejo Creek At Howard Road Bridge	34.1931	-119.0025	1	1	1
Water Toxicity Investigation [1, 3]								
Conejo	10_GATE	10	Conejo Creek Hill Canyon Below North Fork Of Conejo Creek	34.2178	-118.9281	5	5	5
	13_BELT	13	Conejo Creek South Fork Behind Hill Canyon Belt Press Building	34.2078	-118.9194	4	4	4

Tox – Samples will be analyzed for toxicity, OP, and pyrethroid pesticides in water and toxicity, OP, and pyrethroid pesticides in sediment as listed in Table 2.
Pests/PCBs – Samples will be analyzed for OC pesticides and PCBs as listed in Table 2.
GWQC – Samples will be analyzed for General Water Quality Constituents as listed in Table 2.

1. This table depicts the normal toxicity investigation sampling frequency. During year 5, this investigation was put on hold and then re-started as described in text.
2. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and historic site naming conventions, the site names in the annual monitoring reports maintain the original reach designations.
3. Includes two wet events per site; except during years when there is insufficient rainfall to trigger sampling.

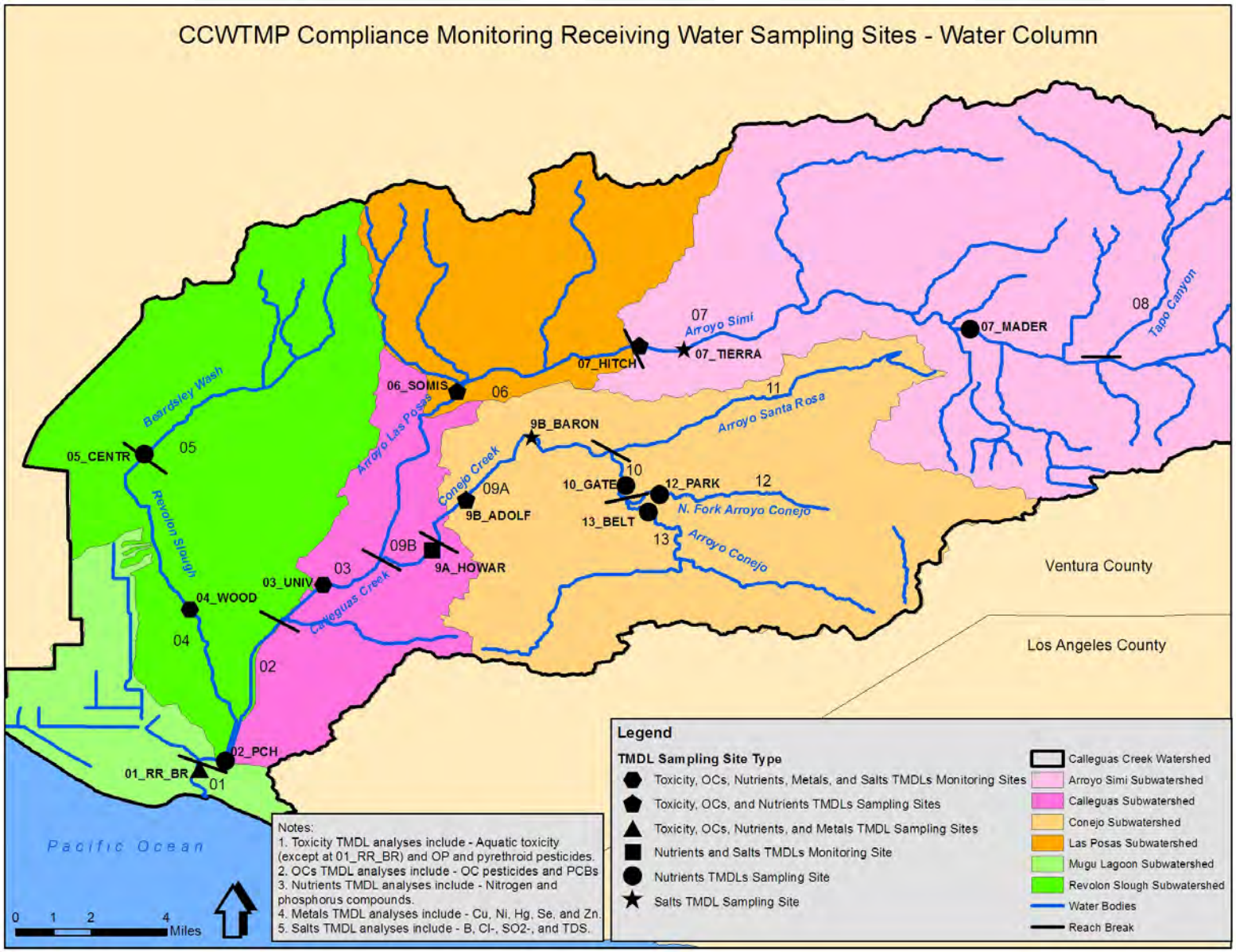


Figure 2. CCWTMP Compliance Monitoring Sampling Sites – Receiving Water

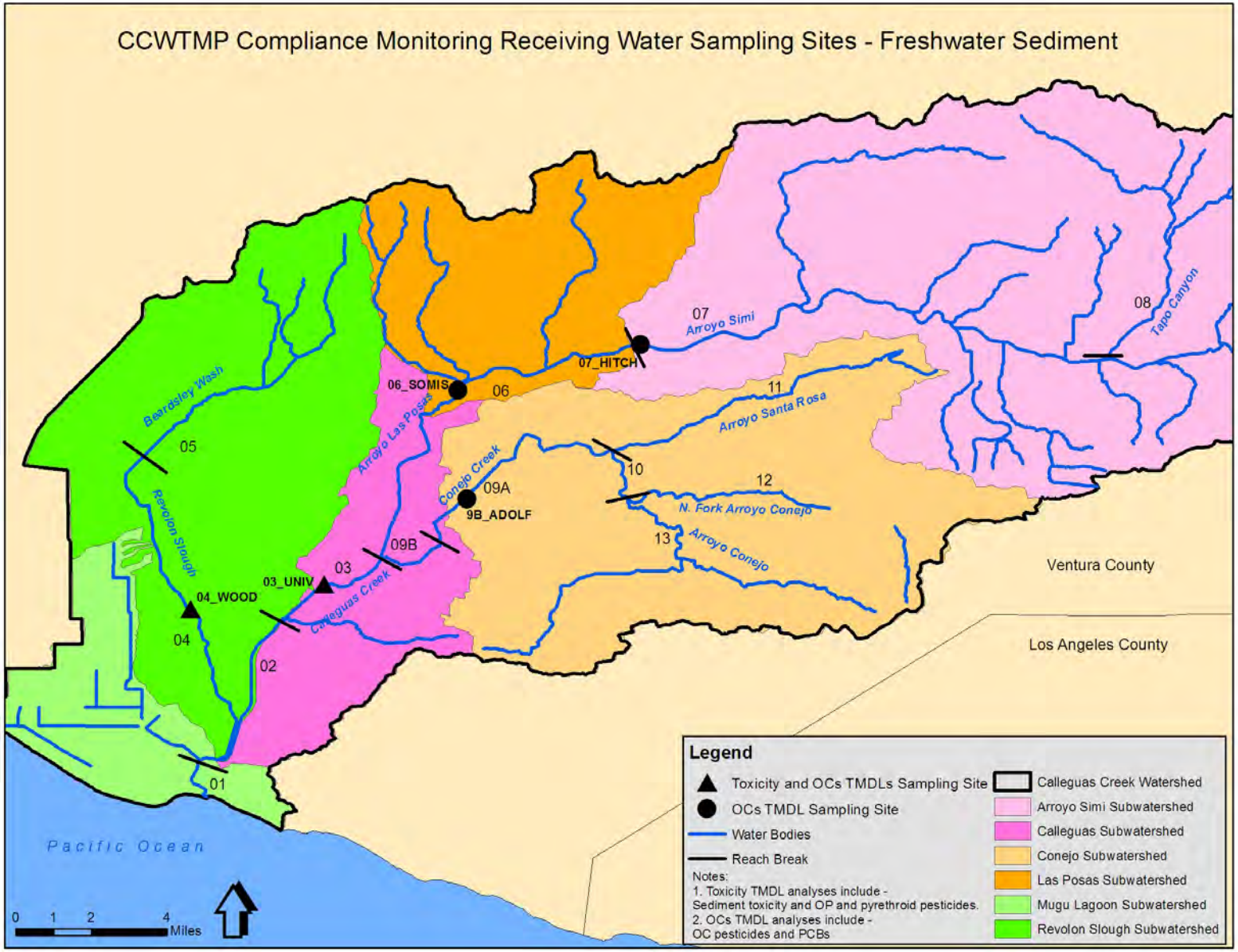


Figure 3. CCWMTP Compliance Monitoring Receiving Water Sampling Sites – Freshwater Sediment

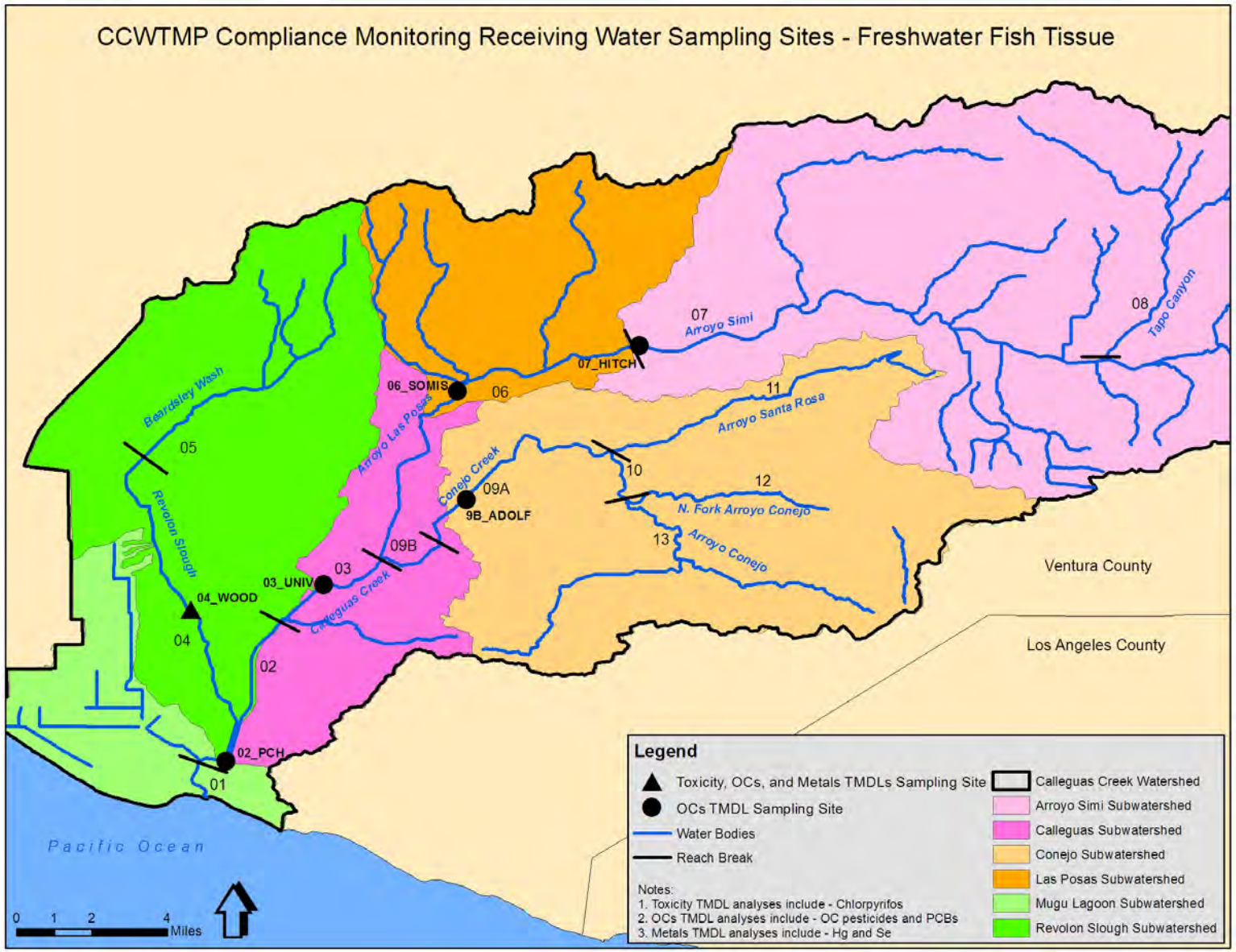


Figure 4. CCWMTP Compliance Monitoring Sampling Sites – Freshwater Fish Tissue

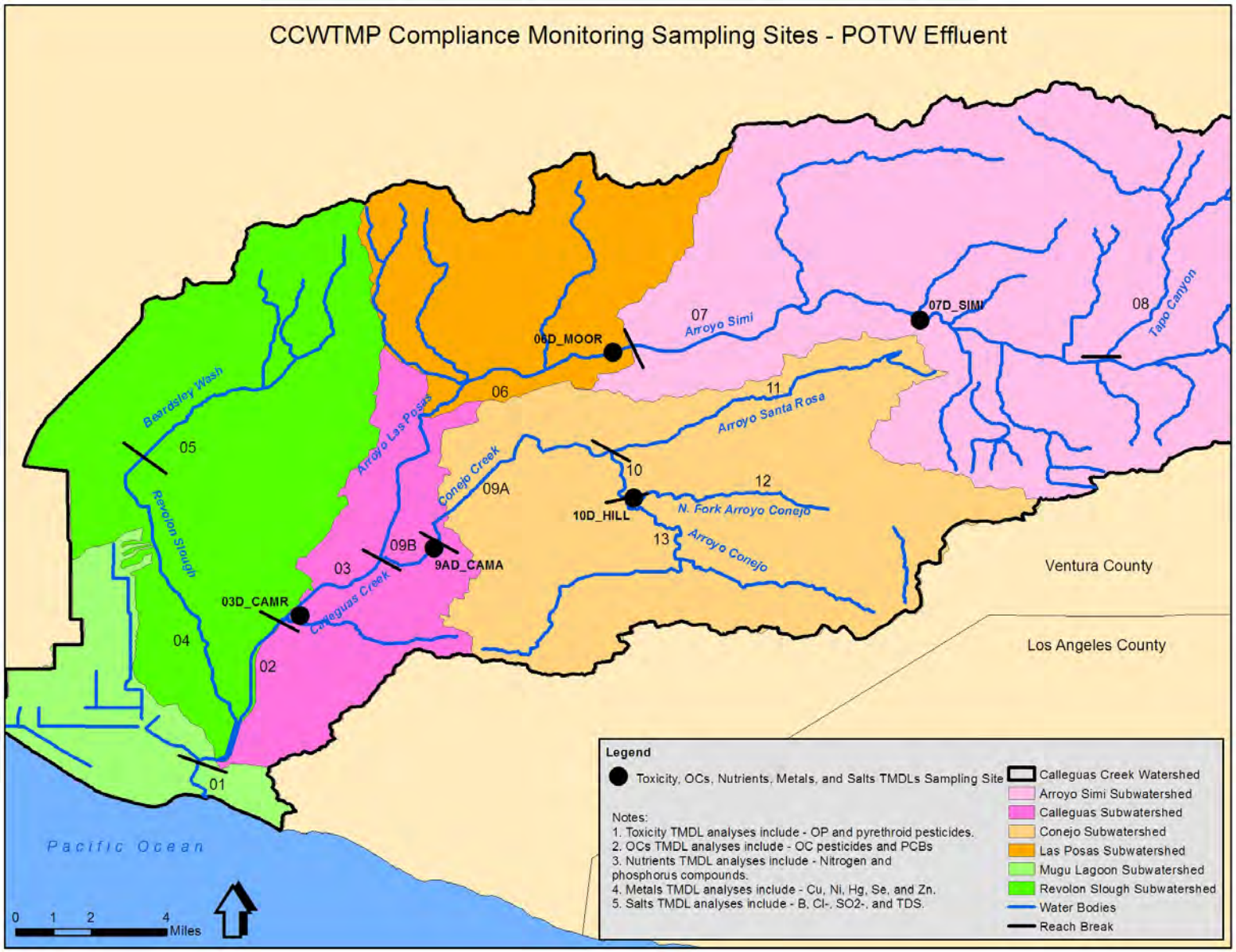


Figure 5. CCWMTP Compliance Monitoring Sampling Sites – POTW Effluent

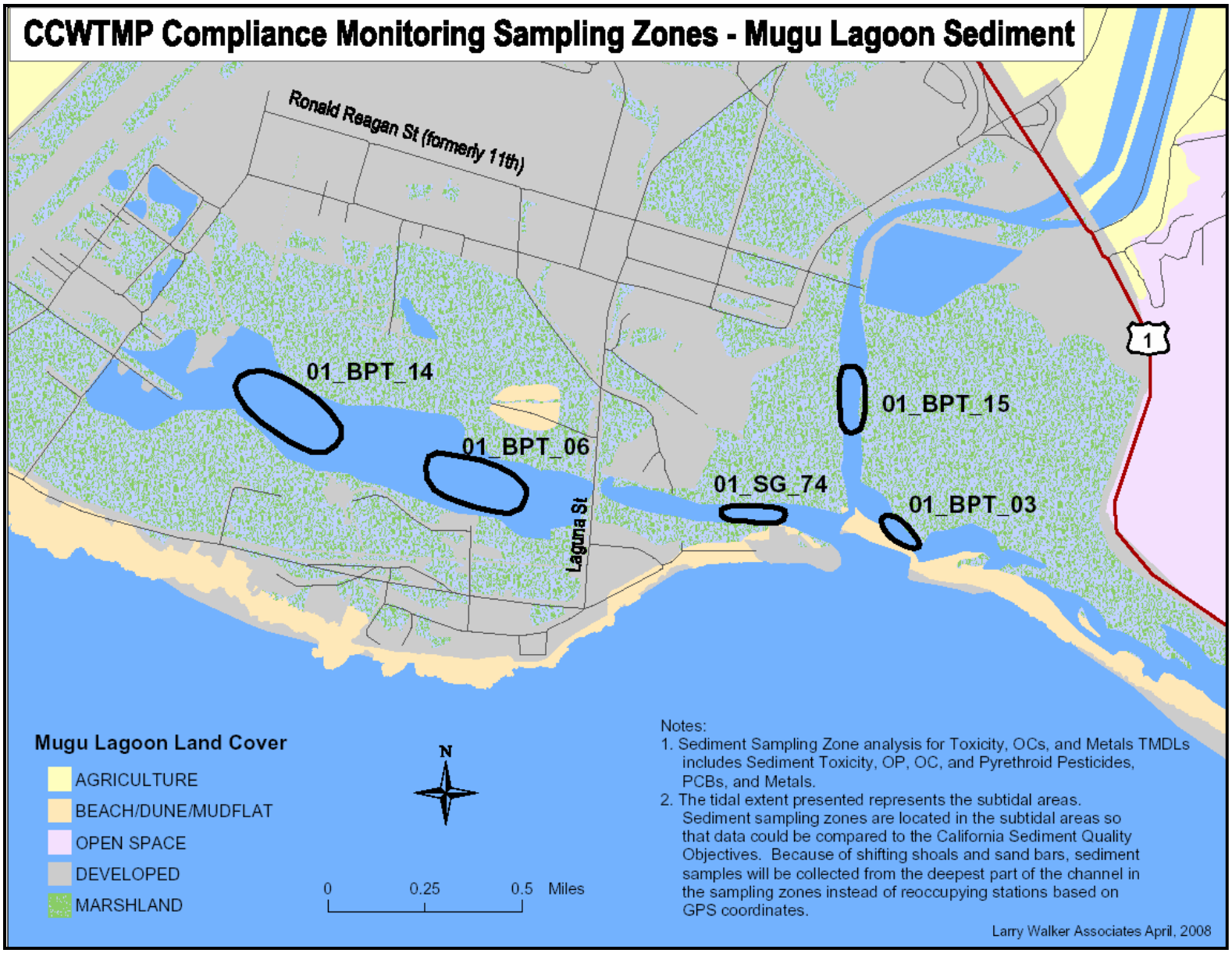


Figure 6. CCWMTP Compliance Monitoring Sampling Zones – Mugu Lagoon Sediment

Figure 7. CCWTMP Compliance Monitoring Sampling Zones – Mugu Lagoon Tissue

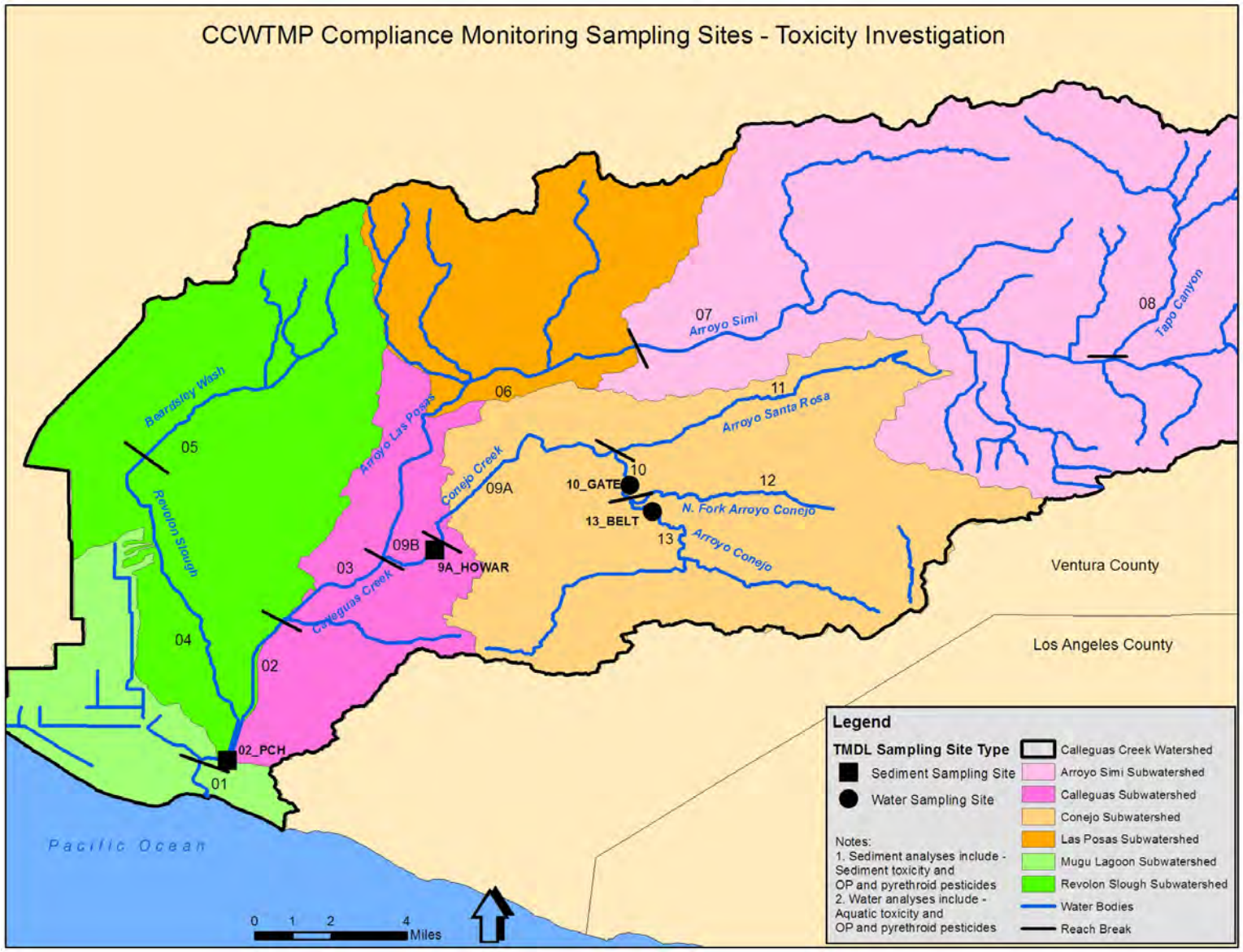


Figure 8. CCWTMP Toxicity Investigation Receiving Water Sampling Sites – Water and Sediment

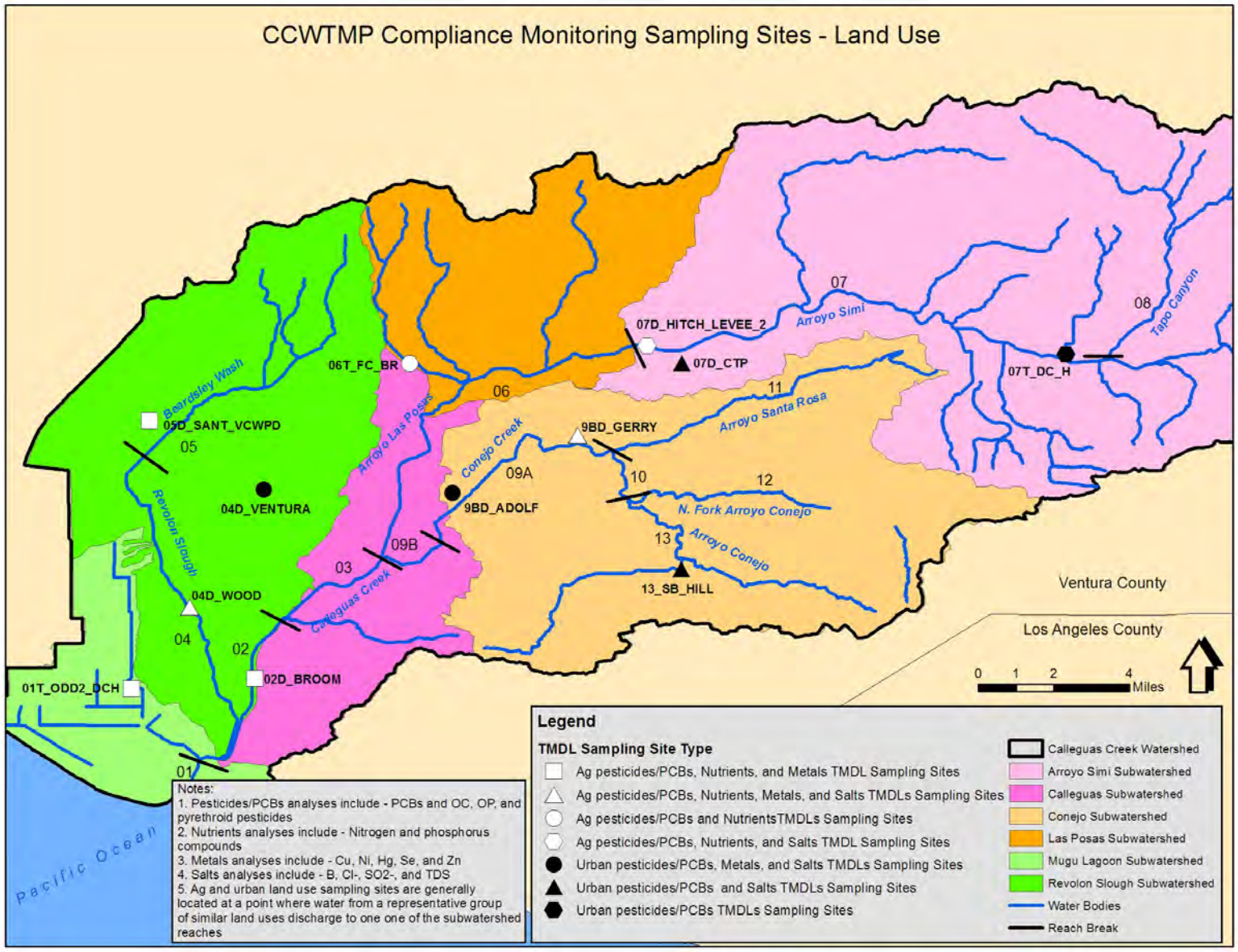


Figure 9. CCWTMP Land Use Sampling Sites

Monitoring Data Summary

To summarize the CCW TMDL monitoring data, box plots have been created for site and constituent combinations representing the data gathered over the entire monitoring program. The data being presented includes all constituents with TMDL limits for water or sediment at the sites where the constituents were analyzed. Where TMDL limits are effective, those thresholds have been identified for the sites where they apply. As appropriate, data for constituents with specific dry or wet weather limits are presented separately. Data collected during year six, which is the reporting period for this document, has been overlain on the box plots as circles. This was done to allow for easy comparison between recent data and what have been collected overall. The sixth year data are presented in tabular form below each box plot. Each figure of box plots presents data from either receiving water sites or land use sites. The receiving water sites are color coded by subwatershed as shown in Table 7. Land use and POTW sites are displayed together and grouped by type as presented in Table 8.

Fish tissue data are not displayed as box plots. Fish tissue data are presented in tables due to the small number of samples and to preserve the species information associated with each sample.

Toxicity data and TIE results are summarized in Appendix D. Summaries of the 2013-14 monitoring events are included as Appendix A.

Some TMDL constituents were never, or rarely detected (less than 2 percent detection rate) and therefore, did not warrant a data summary. The constituents, which were never detected, include:

In Water:

- Endosulfan II
- Endrin

In Sediment:

- Endrin
- BHC, gamma

Rarely detected constituents in water are as follows:

- Aldrin (four detects, none this year)
- Dieldrin (three detects, one this year)
- Endosulfan I (three detects, none this year)
- BHC, gamma (three detects, none this year)
- Total PCBs (five detects, three this year)

Rarely detected constituents in sediment are as follows:

- Dieldrin (one detect, none this year)

Table 7. Receiving Water Sites Color Coded by Subwatershed

Subwatershed	Reach	Site ID
Mugu Lagoon	Reach 1	01_BPT_14
	Reach 1	01_BPT_15
	Reach 1	01_BPT_3
	Reach 1	01_BPT_6
	Reach 1	01_RR_BR
	Reach 1	01_SG_74
Calleguas	Reach 2	02_PCH
	Reach 3	03_UNIV
	Reach 9B [1]	09A_HOWAR [1]
Revolon Slough	Reach 4	04_WOOD
	Reach 5	05_CENTR
Las Posas	Reach 6	06_SOMIS
Arroyo Simi	Reach 7	07_HITCH
	Reach 7	07_MADER
Conejo	Reach 9A [1]	09B_ADOLF [1]
	Reach 9A [1]	09B_BARON [1]
	Reach 10	10_GATE
	Reach 12	12_PARK
	Reach 13	13_BELT

1. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and site naming conventions, the original reach designations have been maintained.

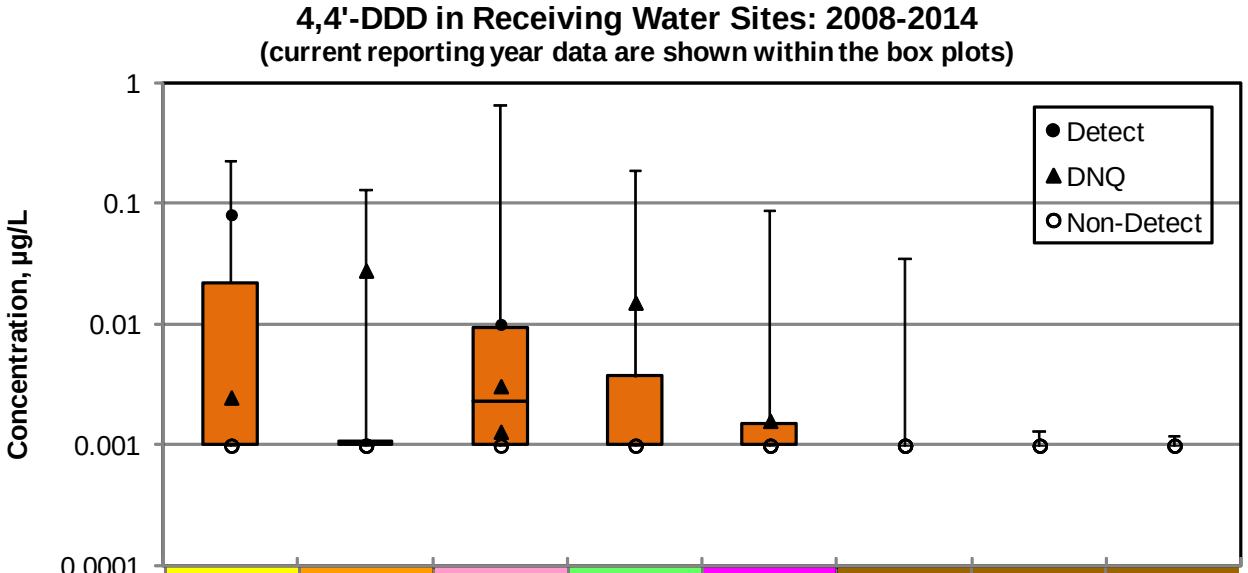
Table 8. Land Use and POTW Sites Color Coded by Type

Urban Land Use (MS4) Sites:	
Reach 4	04D_VENTURA
Reach 7	07D_CTP
Reach 7	07T_DC_H
Reach 9A [1]	09BD_ADOLF [1]
Reach 13	13_SB_HILL
Ag Land Use Sites:	
Reach 1	01T_ODD2_DCH
Reach 2	02D_BROOM
Reach 4	04D_WOOD
Reach 5	05D_SANT_VCWPD
Reach 6	06T_FC_BR
Reach 7	07D_HITCH_LEVEE_2
Reach 9A [1]	09BD_GERRY [1]
POTW Sites:	
Reach 7	07D_SIMI
Reach 9B [1]	09AD_CAMA [1]
Reach 10	10D_HILL

1. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and site naming conventions, the original reach designations have been maintained.

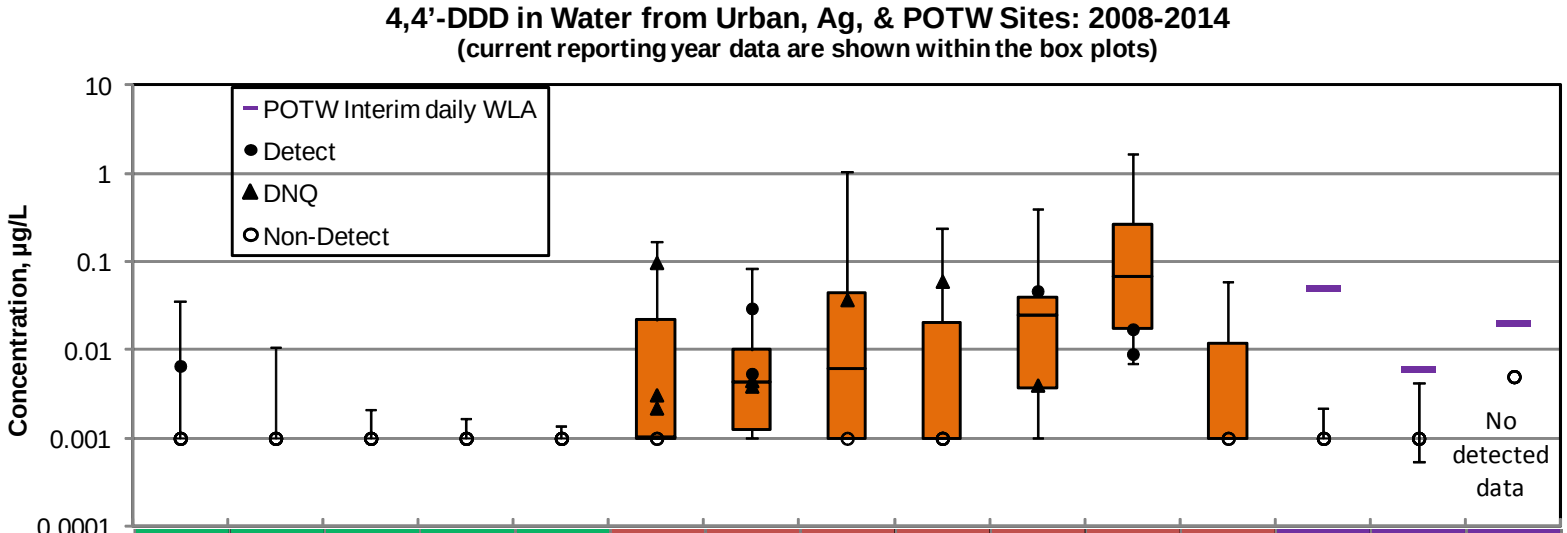
OC PESTICIDES TMDL DATA SUMMARY

The following figures present OC pesticides data in both water and sediment. Presently, only the POTWs have effective interim limits in water but water data for all sites is provided since the TMDL specifies final targets for OC pesticides in water. Effective interim allocations for agriculture and waste load allocations for urban dischargers are provided in the appropriate OC pesticides in sediment figures. Bolded values in the tables within each figure indicate the concentration was above the applicable limits for that constituent. Italicized values in the tables within each figure indicate the concentration was detected but not quantifiable (DNQ). Values in the tables within each figure with a "<" preceding it, indicate the constituent was not detected (ND) at the method detection limit (MDL) for that constituent.



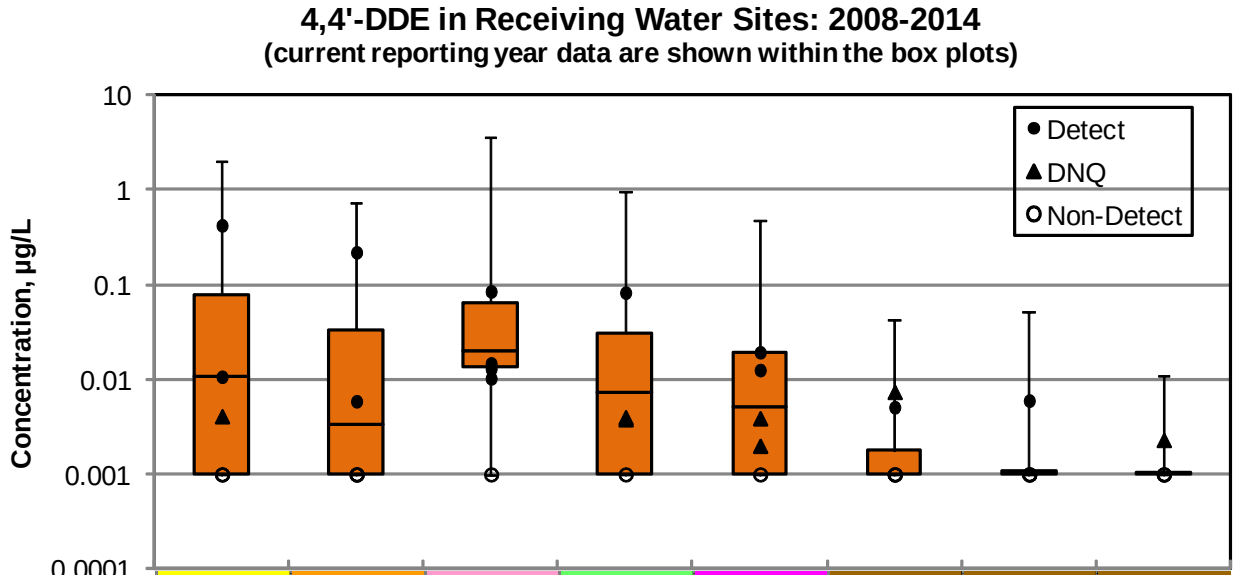
Date	Type	Event	01_RR_BR	03_UNIV	04_WOOD	06_SOMIS	07_HITCH	09B_ADOLF	10_GATE	13_BELT
Aug-13	Dry	39	<0.001	<0.001	*0.0013*	<0.001	<0.001	<0.001	<0.001	<0.001
Nov-13	Dry	40	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Feb-14	Dry	41	<0.001	<0.001	*0.0031*	<0.001	<0.001	<0.001	<0.001	
Feb-14	Storm	42	0.082	*0.0282*	0.0101	*0.0153*	<0.001	<0.001	<0.001	<0.001
May-14	Dry	43	*0.0025*	<0.001	<0.001		*0.0016*	<0.001	<0.001	<0.001

Figure 10. 4,4'-DDD Water Column Concentrations in Receiving Water Sites: 2008-2014



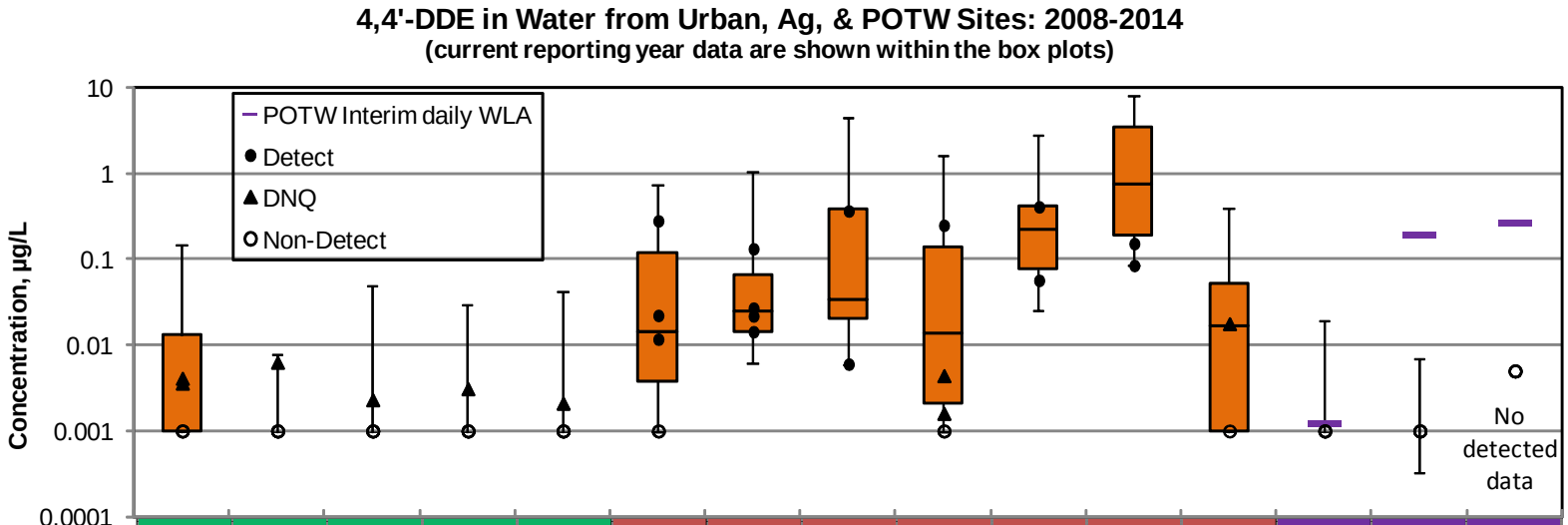
Date	Type	Event	04D_VENTURA	07D_CTP	07T_DC_H	09BD_ADOLF	13_SB_HILL	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			<0.001				<0.001	<0.001	<0.005
Nov-13	Dry	40	0.0066	<0.001	<0.001	<0.001	<0.001	*0.0022*	*0.0045*	<0.001	<0.001	0.0466			<0.001	<0.001	<0.005
Feb-14	Dry	41	<0.001	<0.001	<0.001	<0.001	<0.001	*0.0031*	0.0054		<0.001				<0.001	<0.001	<0.005
Feb-14	Storm	42	<0.001	<0.001	<0.001	<0.001	<0.001	*0.0979*	0.0296	*0.0372*	*0.06*	*0.004*	0.0172	<0.001			
May-14	Dry	43	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	*0.0039*		<0.001		0.009	<0.001	<0.001	<0.001	<0.005

Figure 11. 4,4'-DDD Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2014



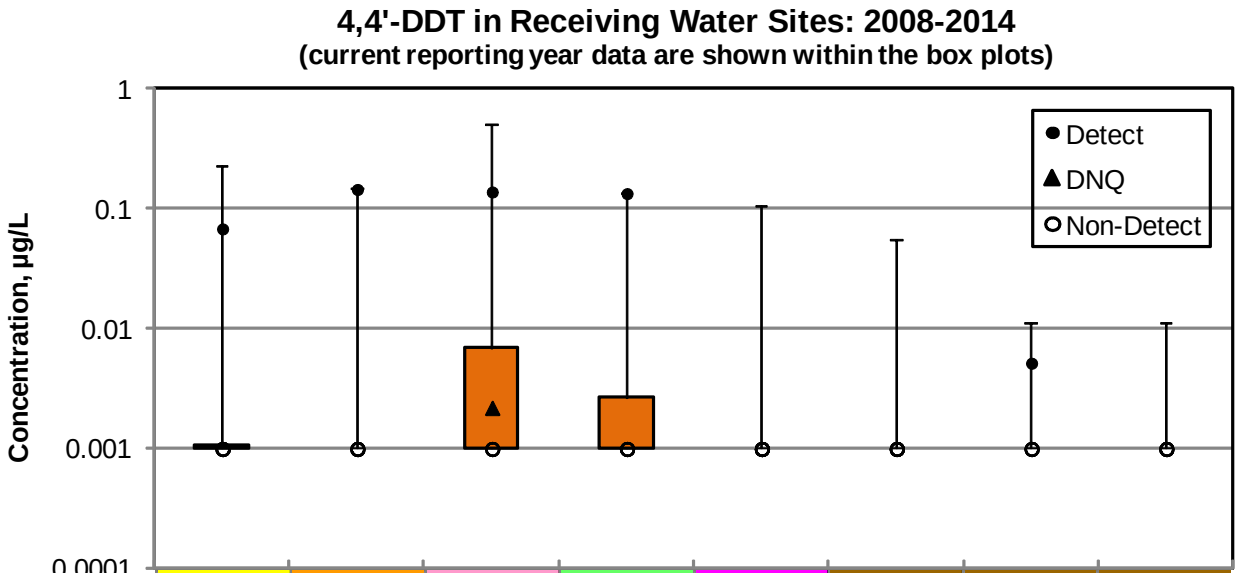
Date	Type	Event	01_RR_BR	03_UNIV	04_WOOD	06_SOMIS	07_HITCH	09B_ADOLF	10_GATE	13_BELT
Aug-13	Dry	39	<0.001	<0.001	0.0103	*0.0038*	<0.001	<0.001	<0.001	<0.001
Nov-13	Dry	40	<0.001	<0.001	0.013	<0.001	*0.002*	<0.001		<0.001
Feb-14	Dry	41	*0.0041*	0.0059	0.0148	*0.004*	*0.0039*	0.0051	0.006	
Feb-14	Storm	42	0.4233	0.2197	0.0851	0.0827	0.0194	*0.0074*	<0.001	*0.0023*
May-14	Dry	43	0.0107	<0.001	<0.001		0.0126	<0.001	<0.001	<0.001

Figure 12. 4,4'-DDE Water Column Concentrations in Receiving Water Sites: 2008-2014



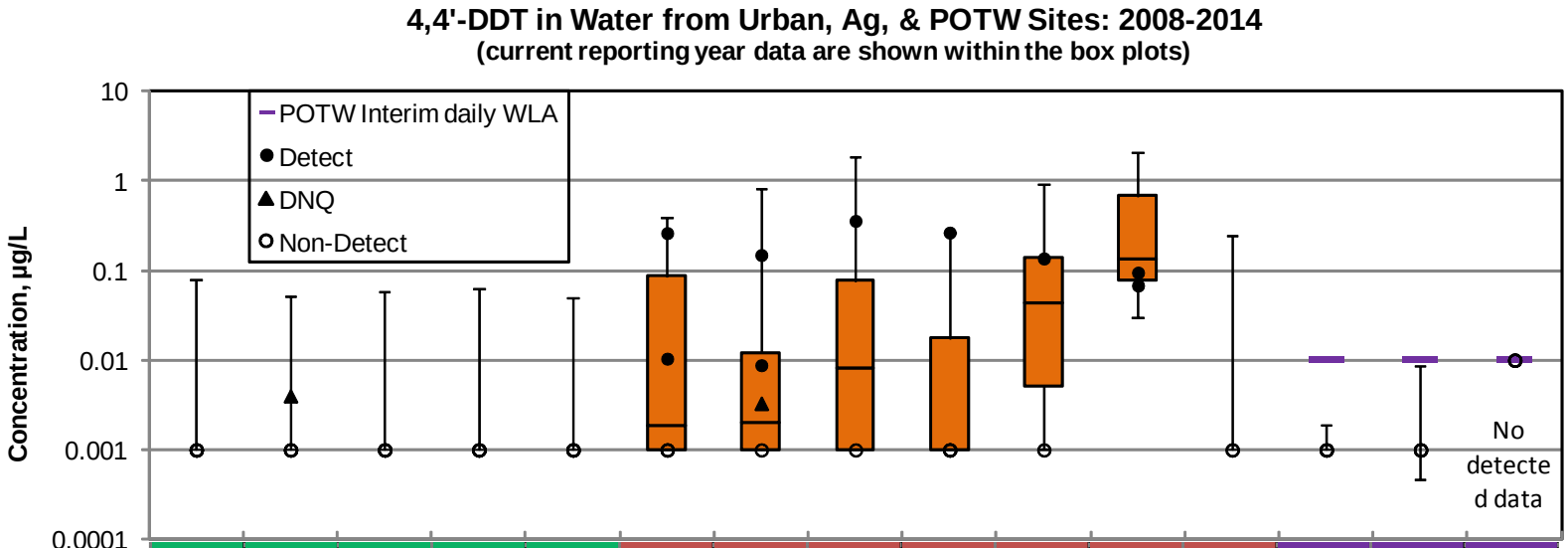
Date	Type	Event	04D_VENTURA	07D_CTP	07T_DC_H	09BD_ADOLF	13_SB_HILL	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			<0.001				<0.001	<0.001	<0.005
Nov-13	Dry	40	*0.0036*	<0.001	<0.001	<0.001	<0.001	0.0117	0.0269	0.006	*0.0044*	0.4061			<0.001	<0.001	<0.005
Feb-14	Dry	41	<0.001	<0.001	<0.001	<0.001	<0.001	0.0221	0.0218		*0.0016*				<0.001	<0.001	<0.005
Feb-14	Storm	42	*0.0041*	*0.0063*	*0.0023*	*0.0031*	*0.0021*	0.2792	0.1322	0.3637	0.2477	0.0566	0.1519	*0.0177*			
May-14	Dry	43	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0143		<0.001		0.0845	<0.001	<0.001	<0.001	<0.005

Figure 13. 4,4'-DDE Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2014



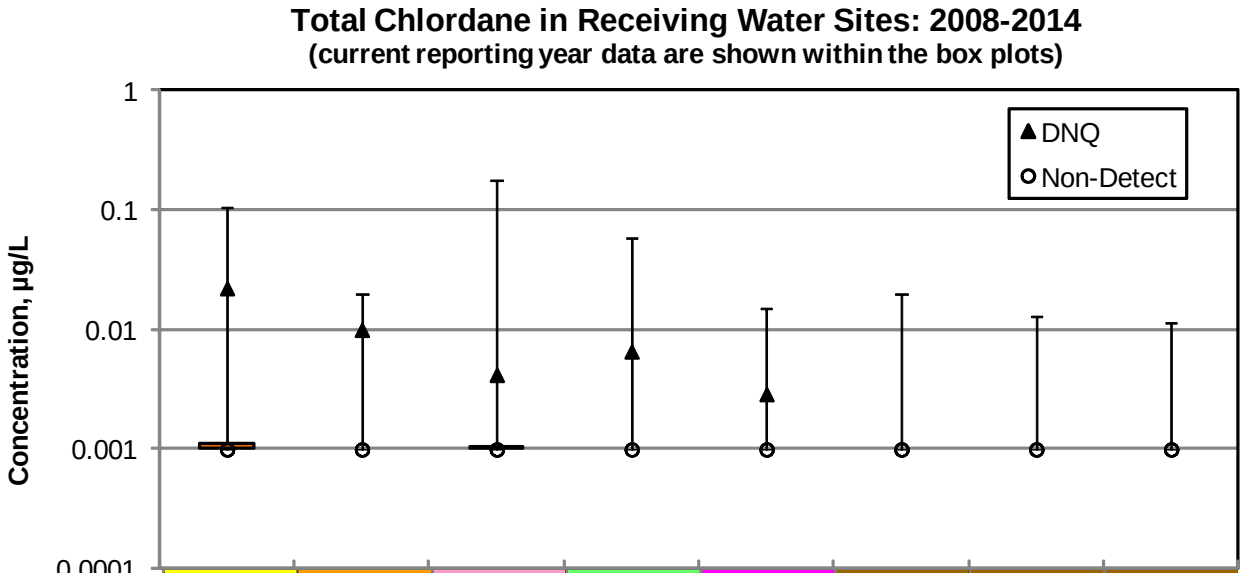
Date	Type	Event	01_RR_BR	03_UNIV	04_WOOD	06_SOMIS	07_HITCH	09B_ADOLF	10_GATE	13_BELT
Aug-13	Dry	39	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nov-13	Dry	40	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Feb-14	Dry	41	<0.001	<0.001	*0.0022*	<0.001	<0.001	<0.001	<0.001	
Feb-14	Storm	42	0.0687	0.1466	0.1395	0.1355	<0.001	<0.001	0.0052	<0.001
May-14	Dry	43	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001

Figure 14. 4,4'-DDT Water Column Concentrations in Receiving Water Sites: 2008-2014



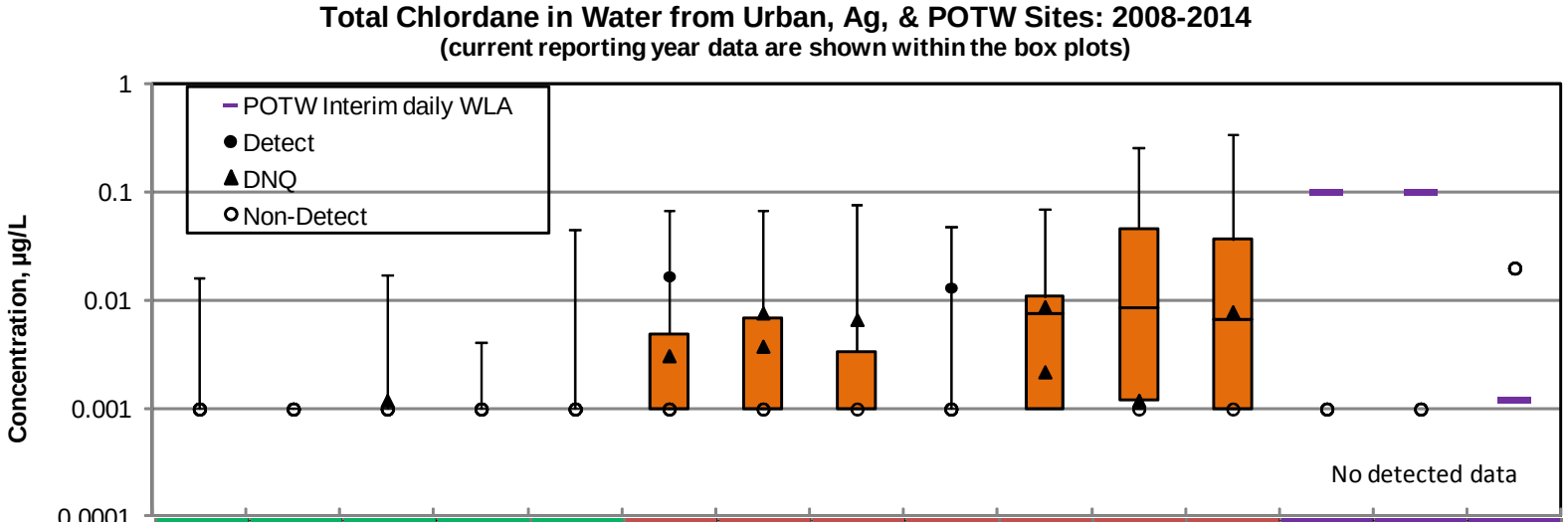
Date	Type	Event	04D_VENTURA	07D_CTP	07T_DC_H	09BD_ADOLF	13_SB_HILL	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			<0.001				<0.001	<0.001	<0.01
Nov-13	Dry	40	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.1365			<0.001	<0.001	<0.01
Feb-14	Dry	41	<0.001	<0.001	<0.001	<0.001	<0.001	0.0104	*0.003*		<0.001				<0.001	<0.001	<0.01
Feb-14	Storm	42	<0.001	*0.004*	<0.001	<0.001	<0.001	0.2615	0.1491	0.358	0.265	<0.001	0.0949	<0.001			
May-14	Dry	43	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0088		<0.001		0.0681	<0.001	<0.001	<0.001	<0.01

Figure 15. 4,4'-DDT Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2014



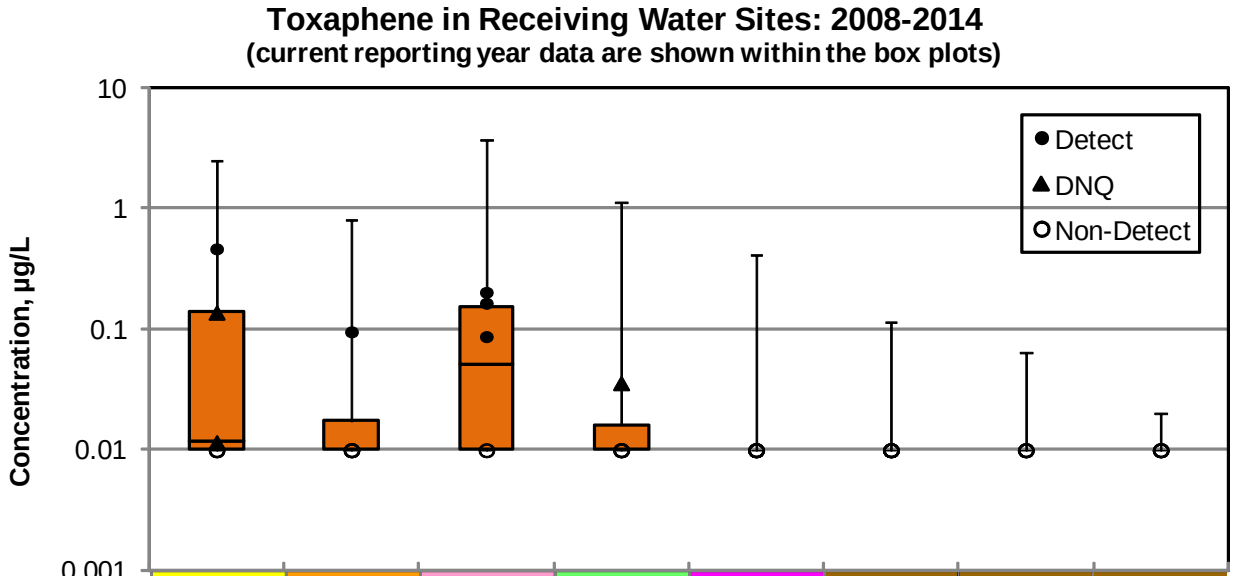
Date	Type	Event	01_RR_BR	03_UNIV	04_WOOD	06_SOMIS	07_HITCH	09B_ADOLF	10_GATE	13_BELT
Aug-13	Dry	39	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nov-13	Dry	40	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Feb-14	Dry	41	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Feb-14	Storm	42	*0.0223*	*0.0100*	*0.0042*	*0.0066*	*0.0029*	<0.001	<0.001	<0.001
May-14	Dry	43	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001

Figure 16. Total Chlordane Water Column Concentrations in Receiving Water Sites: 2008-2014



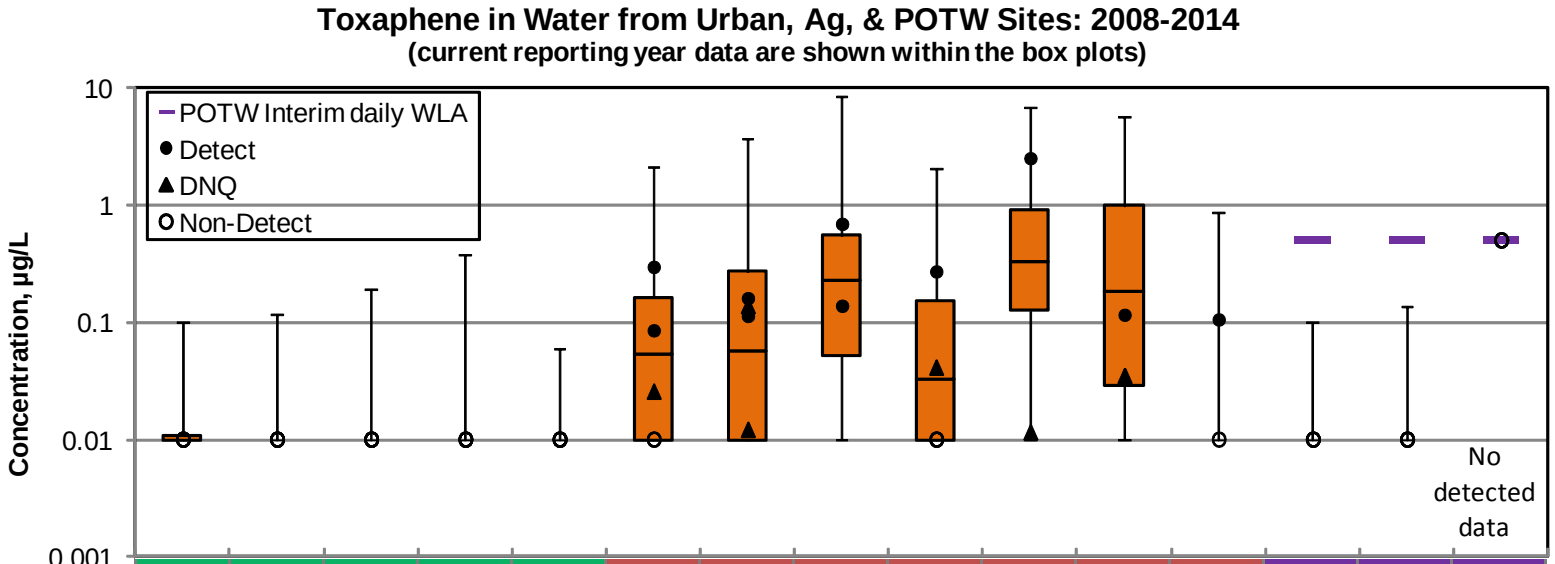
Date	Type	Event	04D_VENTURA	07D_CTP	07T_DC_H	09BD_ADOLF	13_SB_HILL	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			<0.001				<0.001	<0.001	<0.02
Nov-13	Dry	40	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	*0.0022*			<0.001	<0.001	<0.02
Feb-14	Dry	41	<0.001	<0.001	<0.001	<0.001	<0.001	*0.0031*	*0.0038*		<0.001				<0.001	<0.001	<0.02
Feb-14	Storm	42	<0.001	<0.001	*0.0012*	<0.001	<0.001	0.0168	*0.0077*	*0.0067*	0.0132	*0.0088*	*0.0012*	*0.0079*			
May-14	Dry	43	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001		<0.001	<0.001	<0.001	<0.001	<0.02

Figure 17. Total Chlordane Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2014



Date	Type	Event	01_RR_BR	03_UNIV	04_WOOD	06_SOMIS	07_HITCH	09B_ADOLF	10_GATE	13_BELT
Aug-13	Dry	39	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nov-13	Dry	40	<0.01	<0.01	0.0874	<0.01	<0.01	<0.01		<0.01
Feb-14	Dry	41	*0.0116*	<0.01	0.204	<0.01	<0.01	<0.01	<0.01	
Feb-14	Storm	42	*0.138*	0.0957	0.165	*0.04*	<0.01	<0.01	<0.01	<0.01
May-14	Dry	43	0.466	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01

Figure 18. Toxaphene Water Column Concentrations in Receiving Water Sites: 2008-2014



Date	Type	Event	04D_VENTURA	07D_CTP	07T_DC_H	09BD_ADOLF	13_SB_HILL	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01				<0.01	<0.01	<0.5
Nov-13	Dry	40	<0.01	<0.01	<0.01	<0.01	<0.01	0.085	0.159	0.137	<0.01	2.488			<0.01	<0.01	<0.5
Feb-14	Dry	41	<0.01	<0.01	<0.01	<0.01	<0.01	*0.026*	0.112		*0.041*				<0.01	<0.01	<0.5
Feb-14	Storm	42	<0.01	<0.01	<0.01	<0.01	<0.01	0.295	*0.138*	0.686	0.269	*0.012*	*0.035*	0.105			
May-14	Dry	43	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*0.012*		<0.01		0.115	<0.01	<0.01	<0.01	<0.5

Figure 19. Toxaphene Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2014

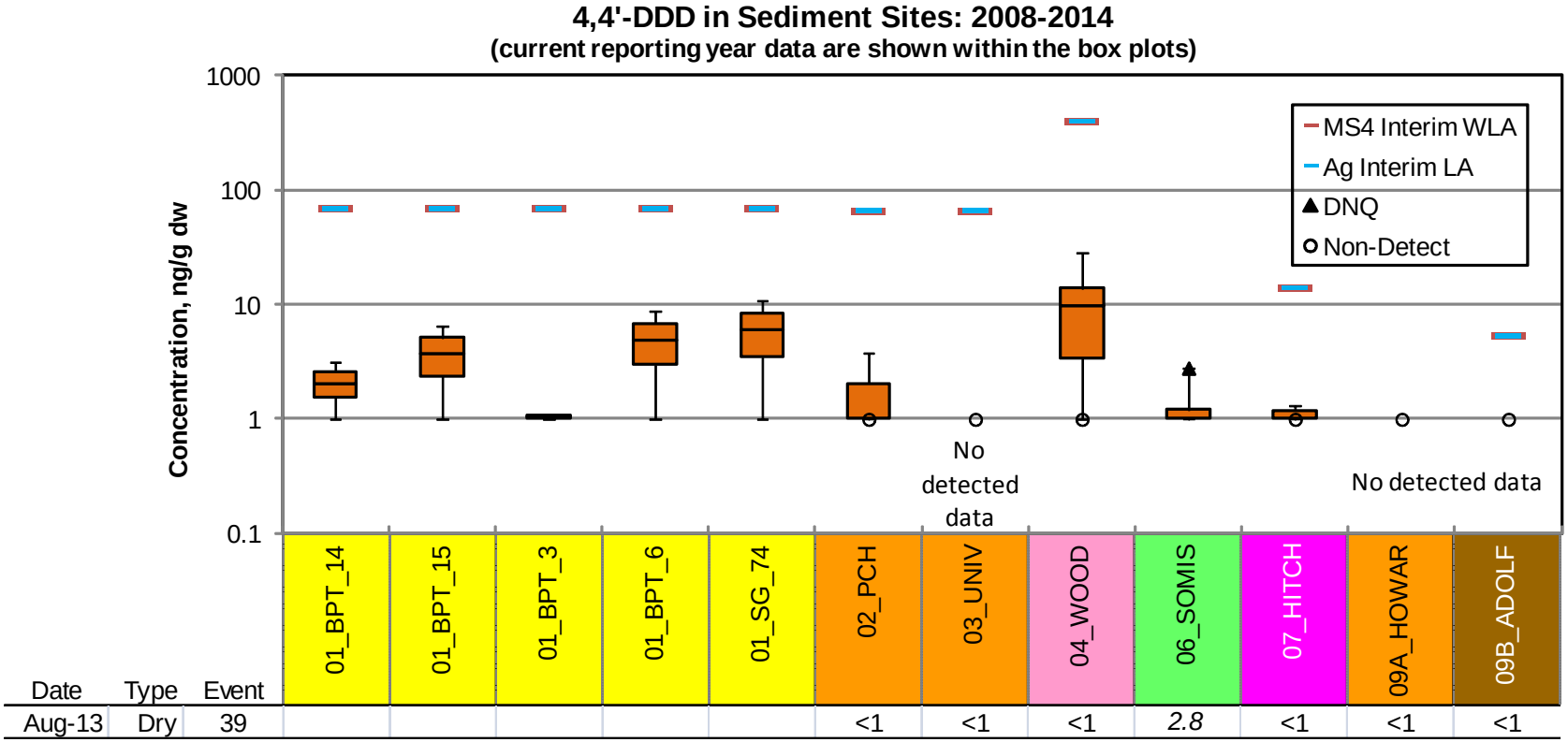


Figure 20. 4,4'-DDD Sediment Concentrations in Receiving Water Sites: 2008-2014

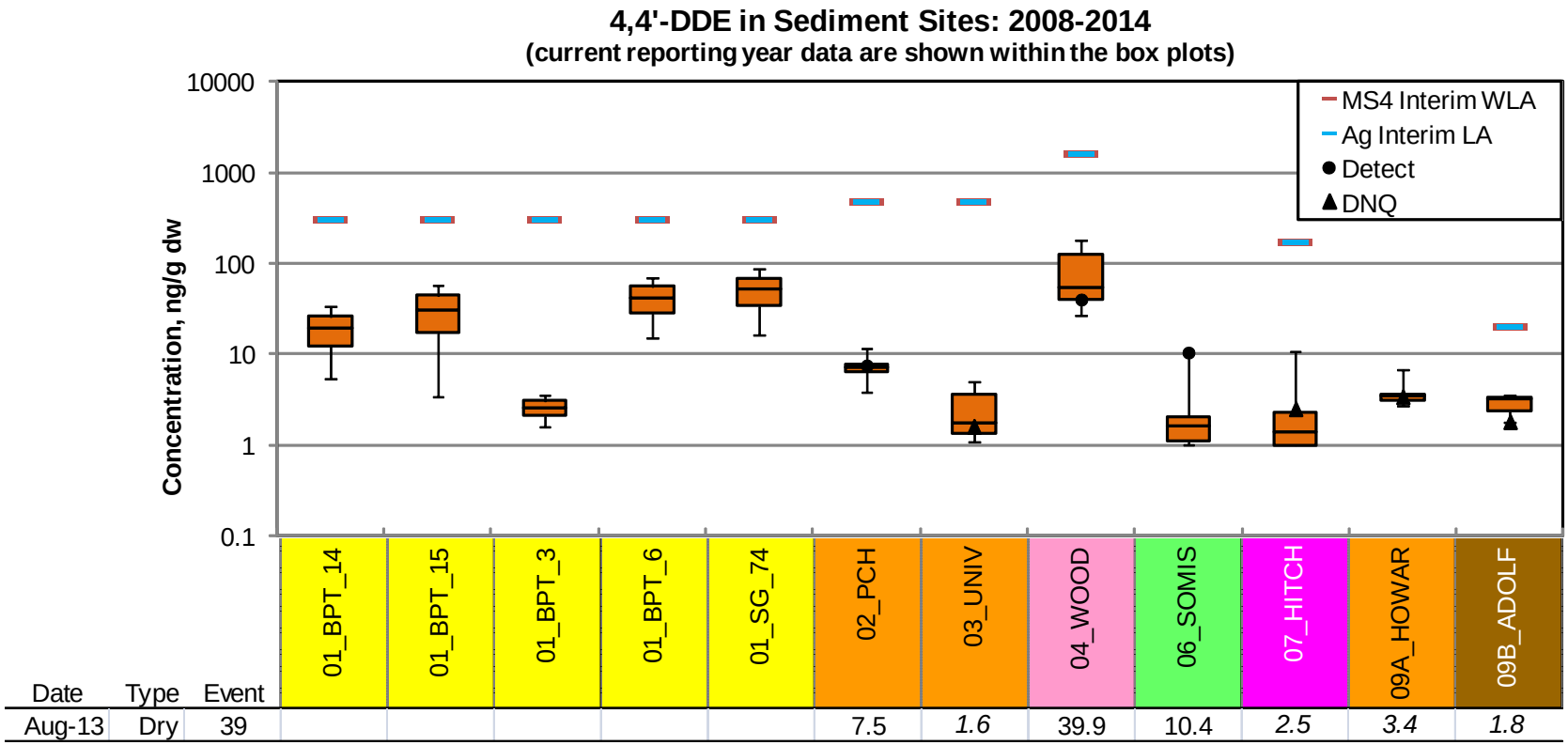


Figure 21. 4,4'-DDE Sediment Concentrations in Receiving Water Sites: 2008-2014

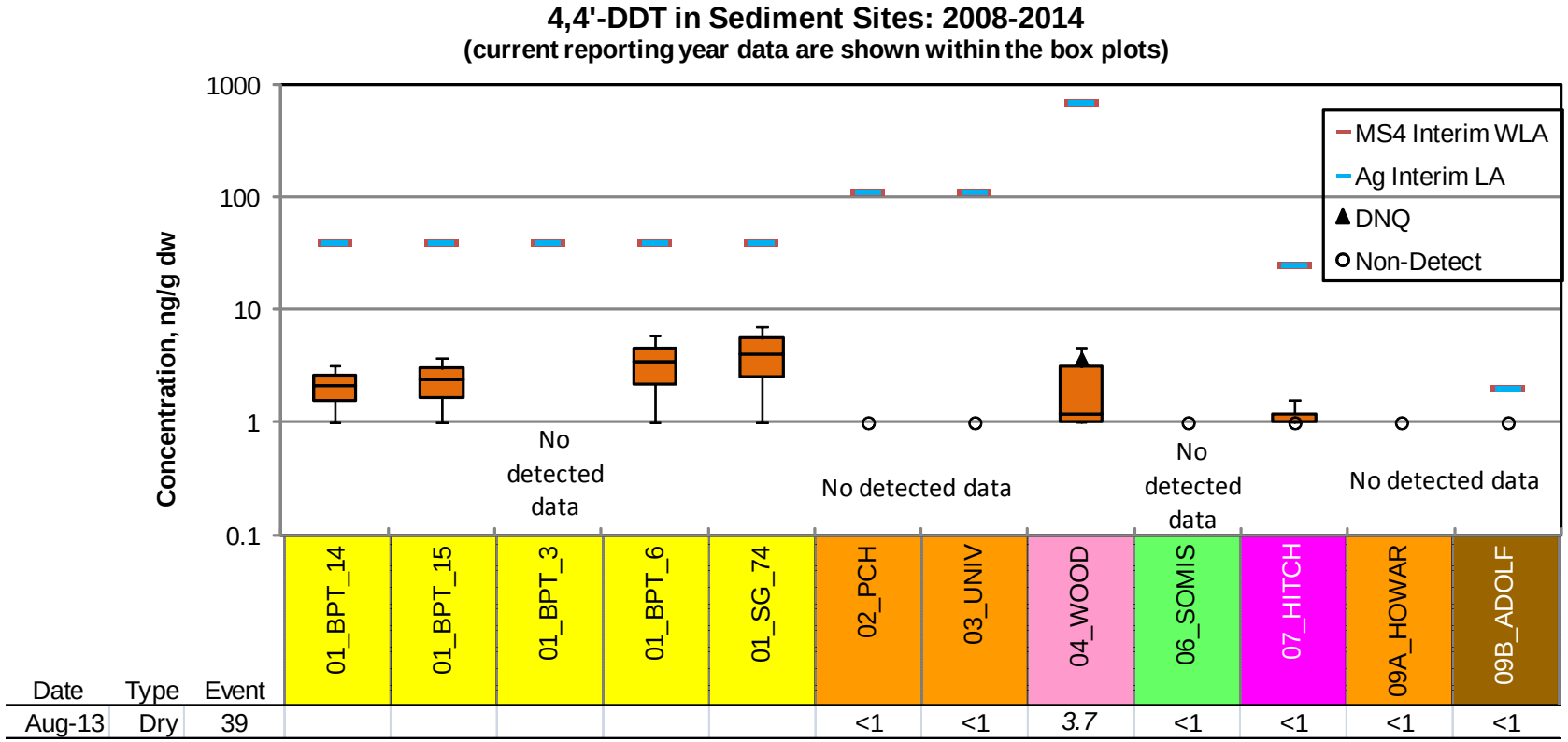


Figure 22. 4,4'-DDT Sediment Concentrations in Receiving Water Sites: 2008-2014

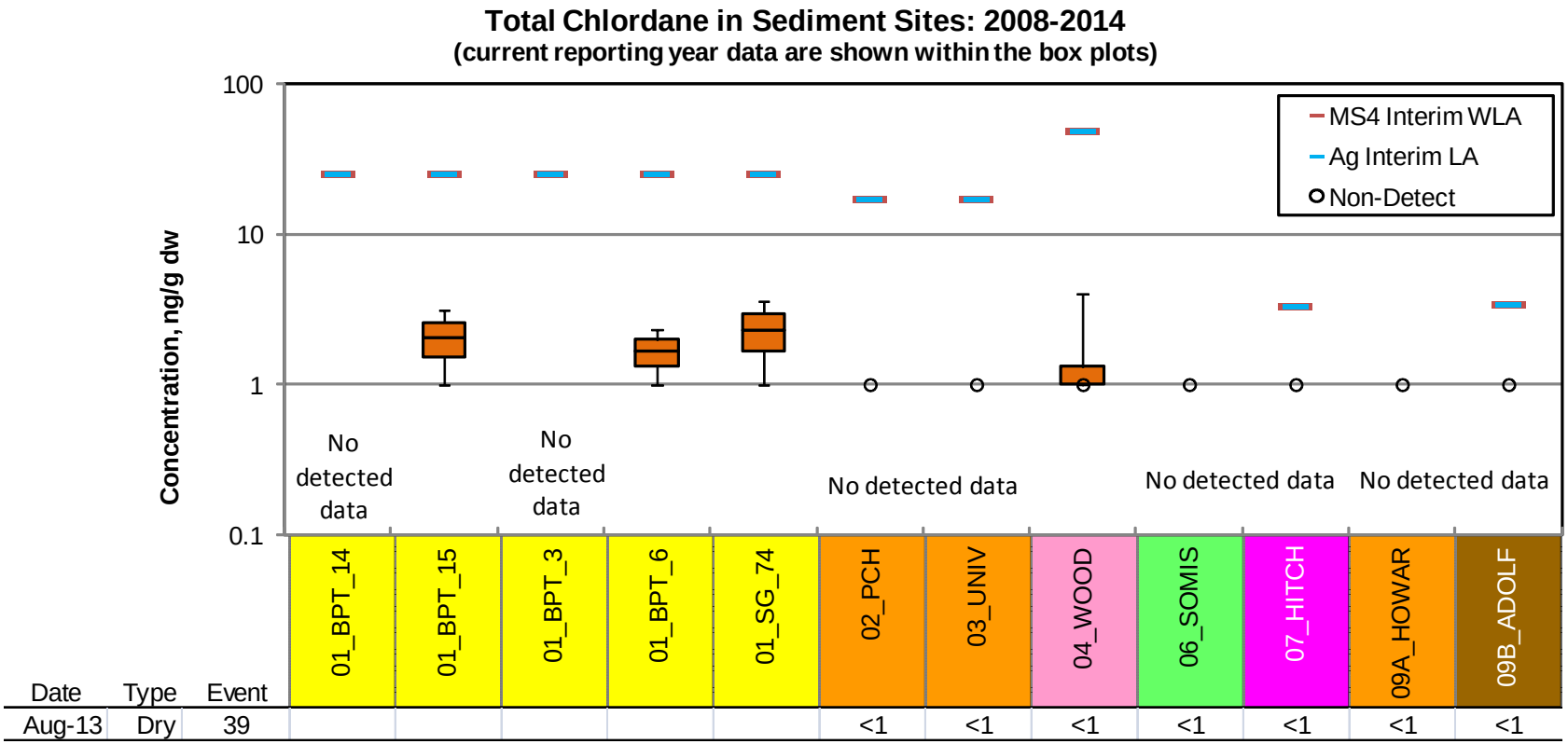


Figure 23. Total Chlordane Sediment Concentrations in Receiving Water Sites: 2008-2014

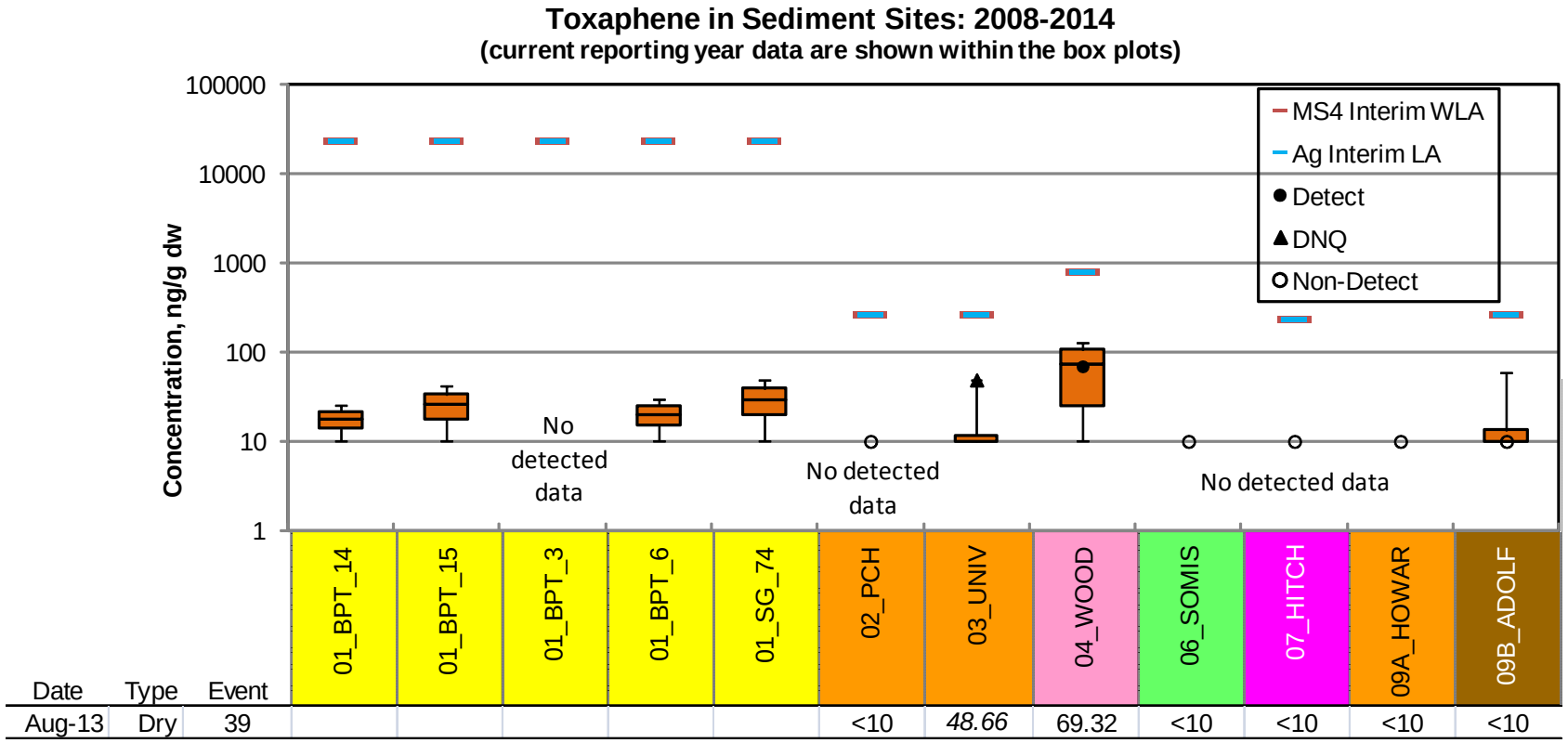
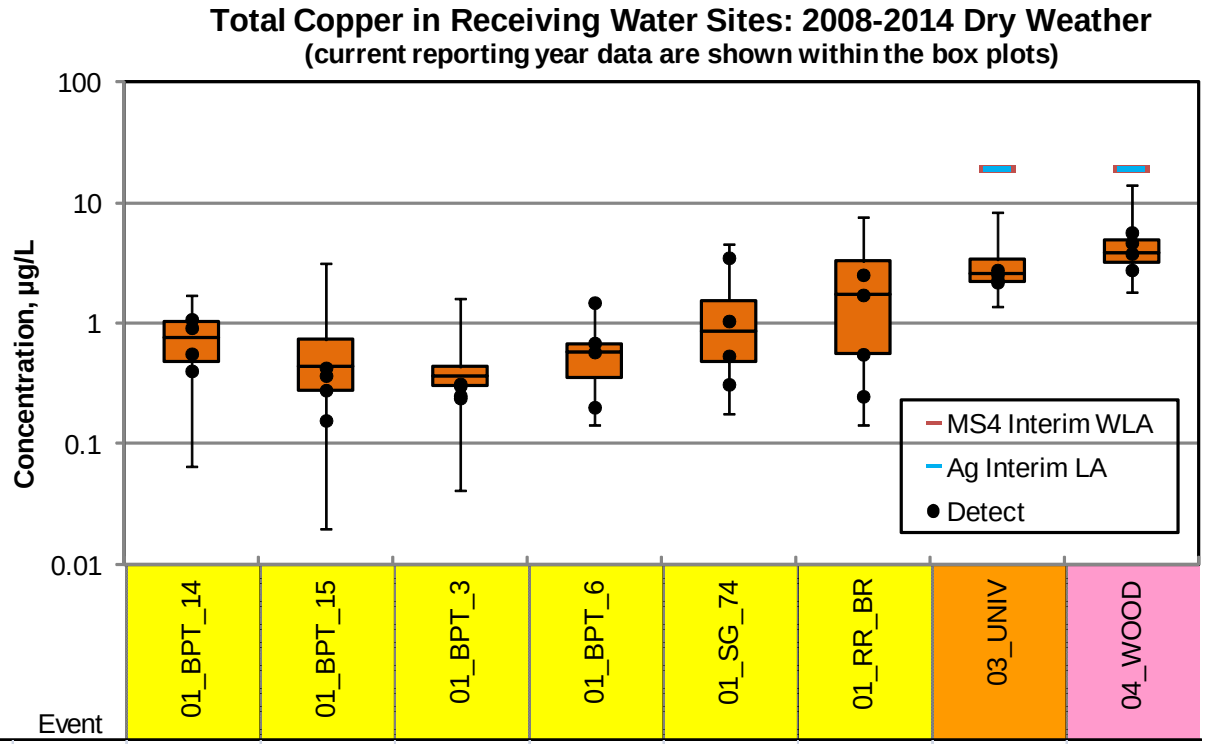


Figure 24. Toxaphene Sediment Concentrations in Receiving Water Sites: 2008-2014

METALS TMDL DATA SUMMARY

The following figures present metals water quality data from receiving water, agricultural, urban, and POTW monitoring sites. Currently effective total metals interim load allocations and waste load allocations differ for wet and dry weather, therefore the data for each of these conditions is provided separately. Interim POTW waste load allocations for total mercury are in load form and are therefore calculated and presented in the compliance section of the report. The Metals TMDL specifies final targets for both dissolved copper and zinc. Dissolved concentrations for these two metals have been plotted for reference. Bolded values in the tables within each figure indicate the concentration was above the applicable limits for that constituent. Italicized values in the tables within each figure indicate the concentration was DNQ. Values in the tables within each figure with a "<" preceding them, indicate the constituent was ND at the MDL for that constituent.



Date	Event	01_BPT_14	01_BPT_15	01_BPT_3	01_BPT_6	01_SG_74	01_RR_BR	03_UNIV	04_WOOD
Aug-13	39	0.561	0.157	0.252	0.202	0.539	0.249	2.282	4.683
Nov-13	40	0.405	0.429	0.304	1.491	3.516	0.556	2.2	3.804
Feb-14	41	1.084	0.37	0.241	0.58	0.313	1.726	2.78	5.694
May-14	43	0.922	0.28	0.315	0.688	1.049	2.537	2.554	2.781

Figure 25. Total Copper Dry Weather Concentrations in Receiving Water Sites: 2008-2014

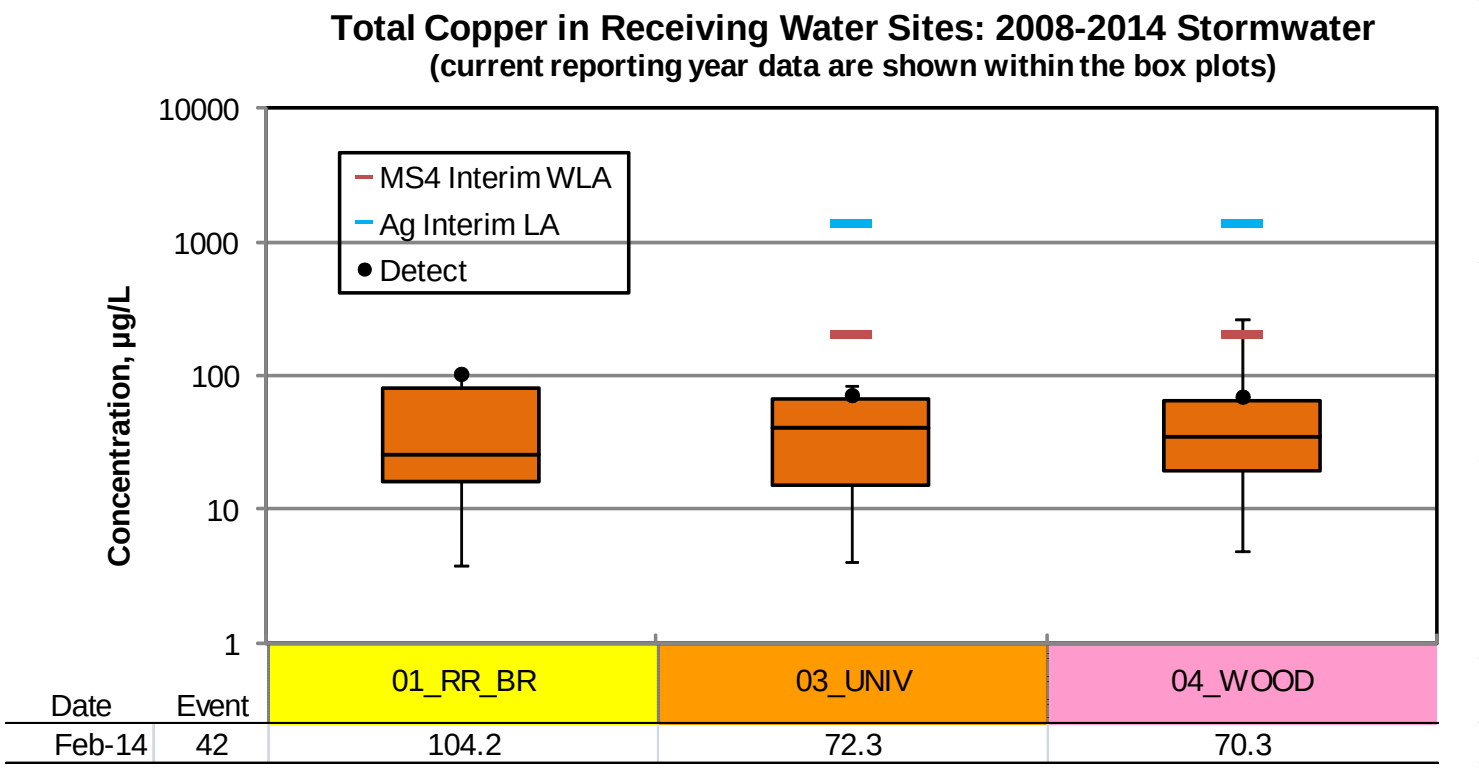
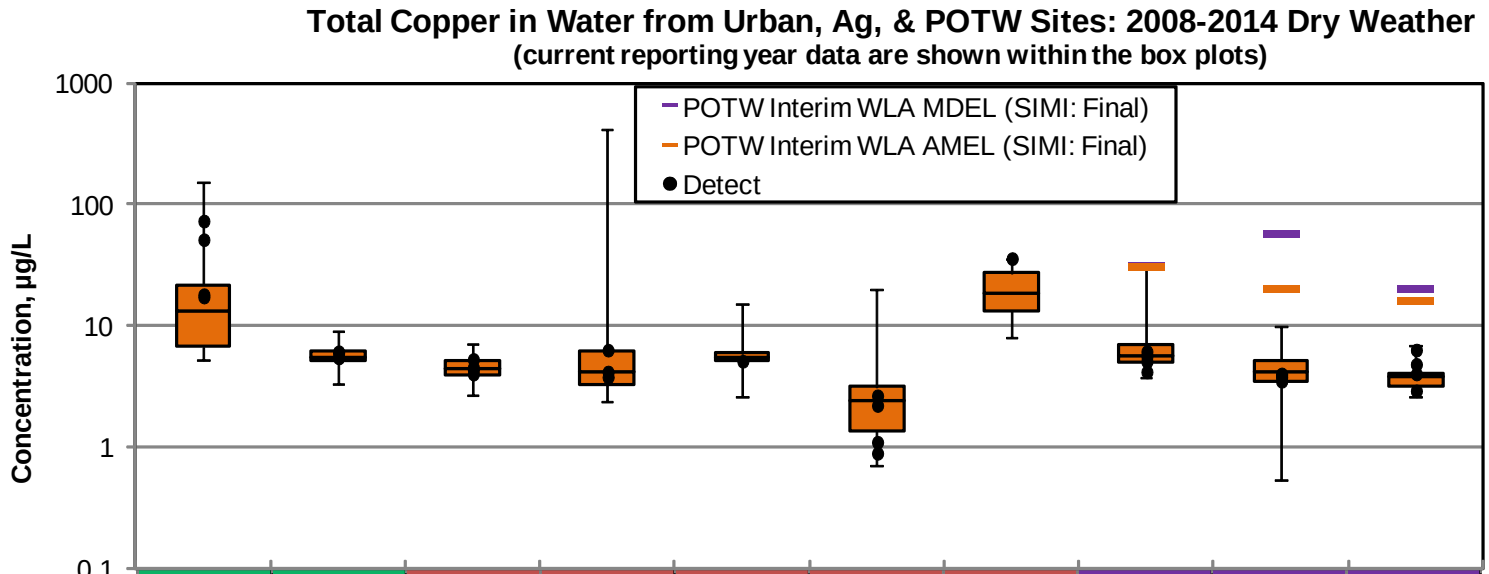


Figure 26. Total Copper Stormwater Concentrations in Receiving Water Sites: 2008-2014



Date	Event	04D_VENTURA	09BD_ADOLF	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	39	51.163	6.1	3.99			0.887		6.109	3.482	6.3
Nov-13	40	72.879	5.954	5.267	6.283	5.089	2.644		5.066	3.752	4.8
Feb-14	41	17.225	5.424	4.344	4.146		1.093		4.158	3.998	4
May-14	43	18.006	5.535	4.521	3.767		2.201	35.772	5.618	3.872	2.9

Figure 27. Total Copper Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2014

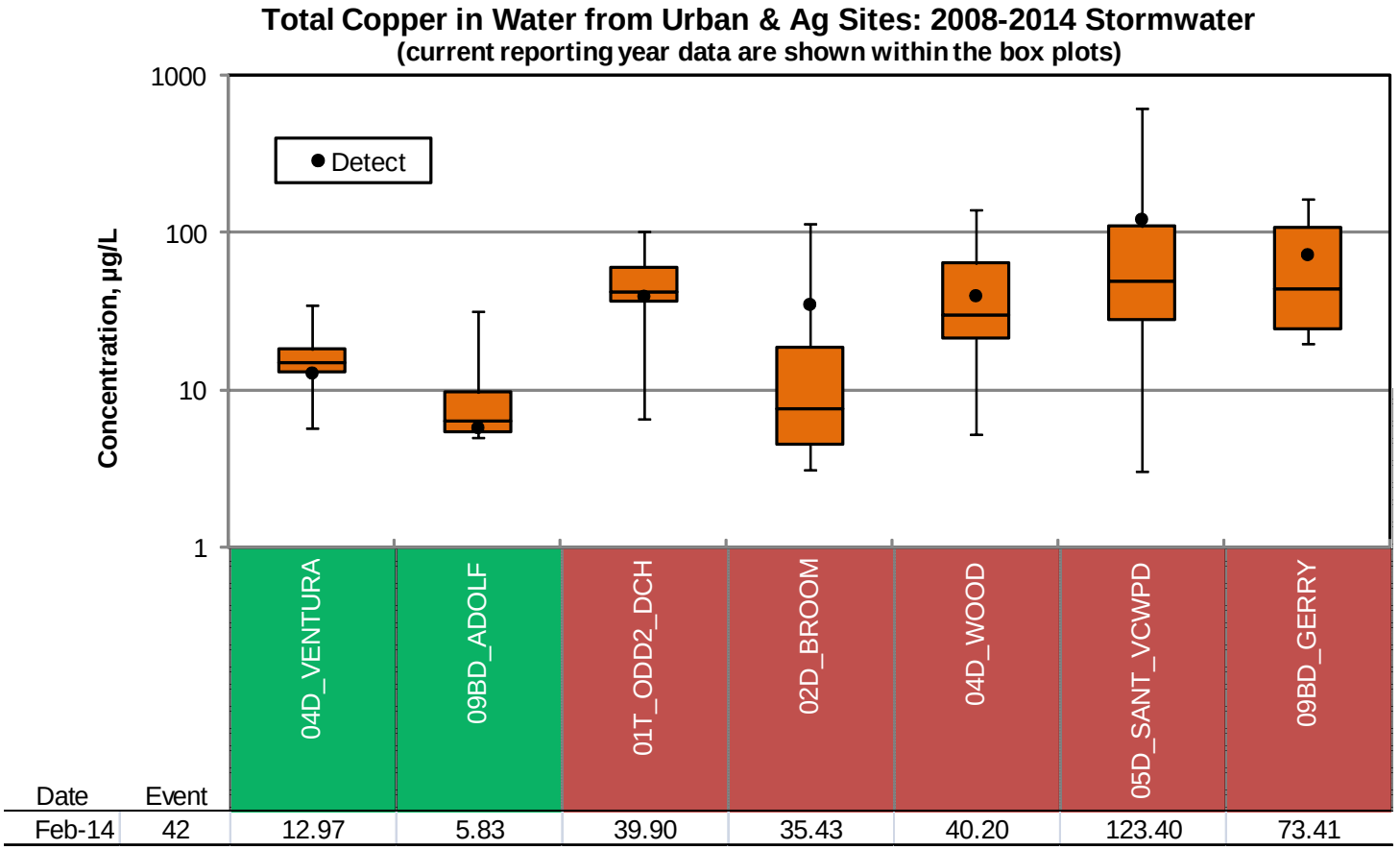
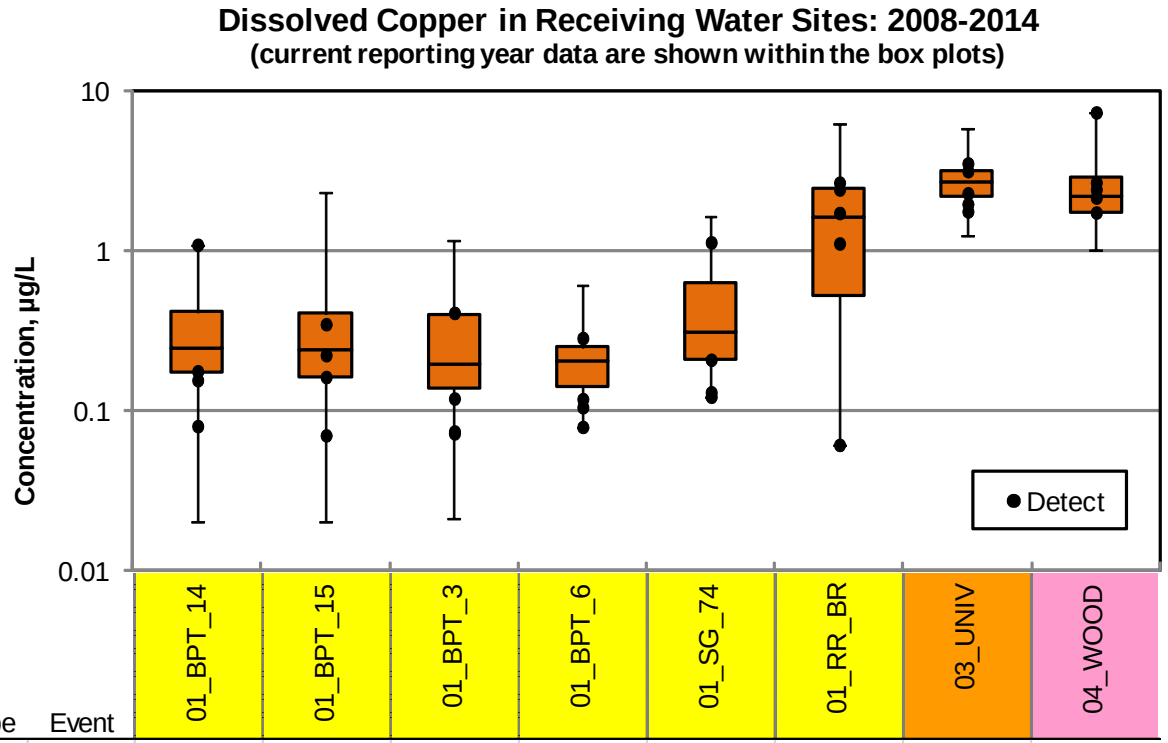
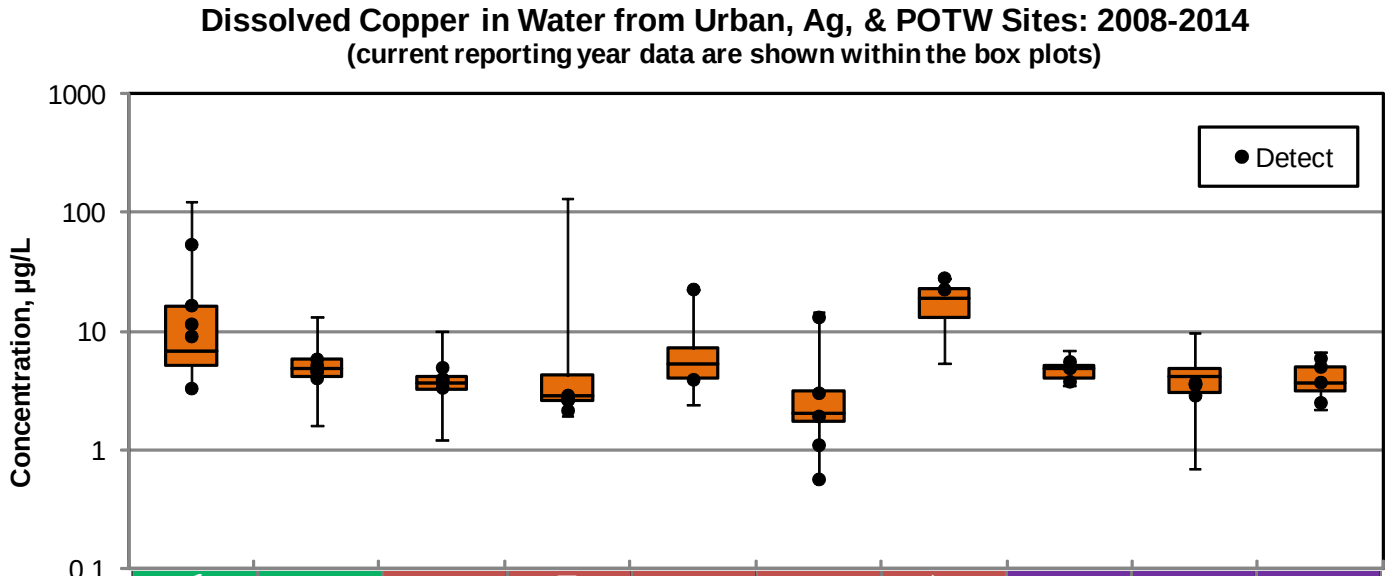


Figure 28. Total Copper Wet Weather Concentrations in Urban and Ag Sites: 2008-2014



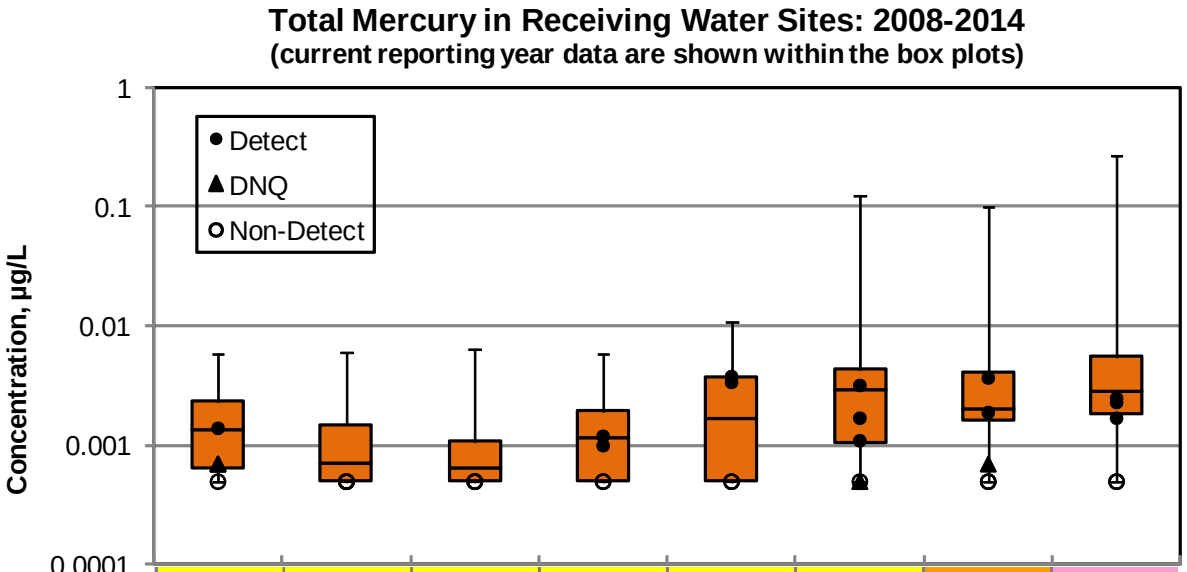
Date	Type	Event	01_BPT_14	01_BPT_15	01_BPT_3	01_BPT_6	01_SG_74	01_RR_BR	03_UNIV	04_WOOD
Aug-13	Dry	39	0.16	0.22	0.072	0.11	0.12	2.67	1.76	2.67
Nov-13	Dry	40	0.080	0.16	0.12	0.12	0.21	0.061	3.51	2.15
Feb-14	Dry	41	0.18	0.070	0.074	0.079	0.13	1.11	1.96	1.73
Feb-14	Storm	42						2.42	3.15	7.33
May-14	Dry	43	1.09	0.35	0.41	0.28	1.13	1.72	2.29	2.42

Figure 29. Dissolved Copper Concentrations in Receiving Water Sites: 2008-2014



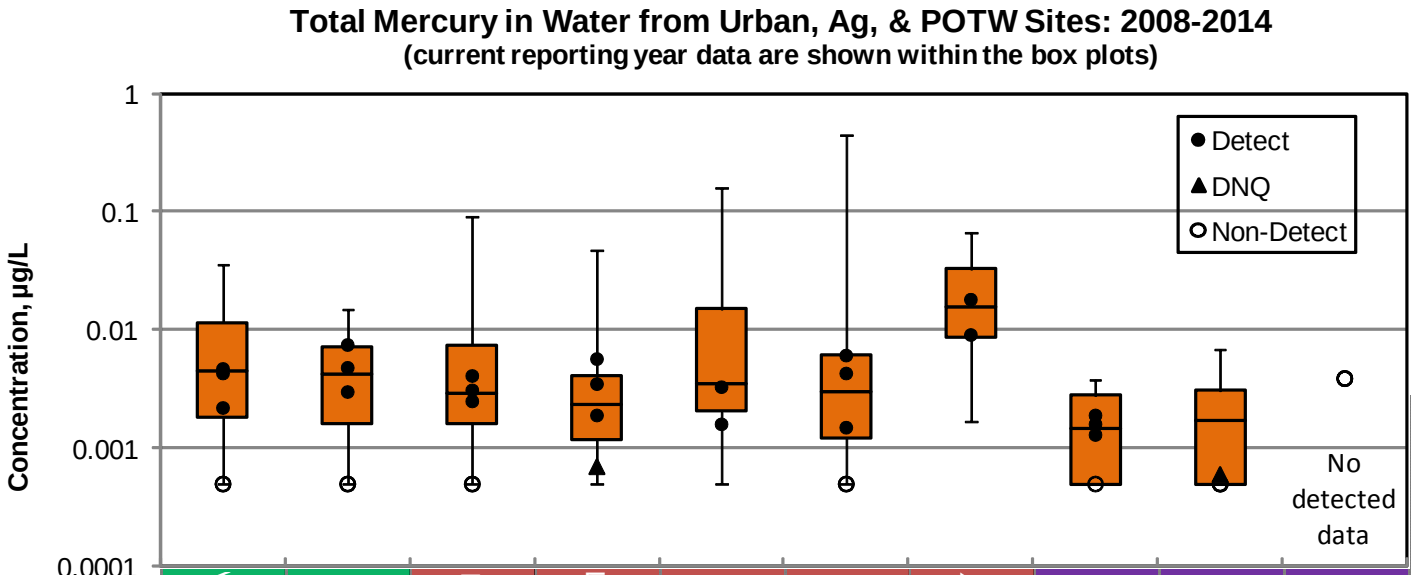
Date	Type	Event	04D_VENTURA	09BD_ADOLF	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	3.29	5.14	3.34			0.57		5.52	2.87	5.90
Nov-13	Dry	40	53.4	5.79	3.75	2.15	3.90	3.01		4.89	3.67	5.00
Feb-14	Dry	41	11.43	4.66	3.86	2.63		1.10		3.76	3.54	3.70
Feb-14	Storm	42	9.03	4.01	4.93	2.88	22.4	13.1	22.4			
May-14	Dry	43	16.4	4.56	3.96	2.63		1.92	27.9	4.88	3.57	2.50

Figure 30. Dissolved Copper Concentrations in Urban, Ag, and POTW Sites: 2008-2014



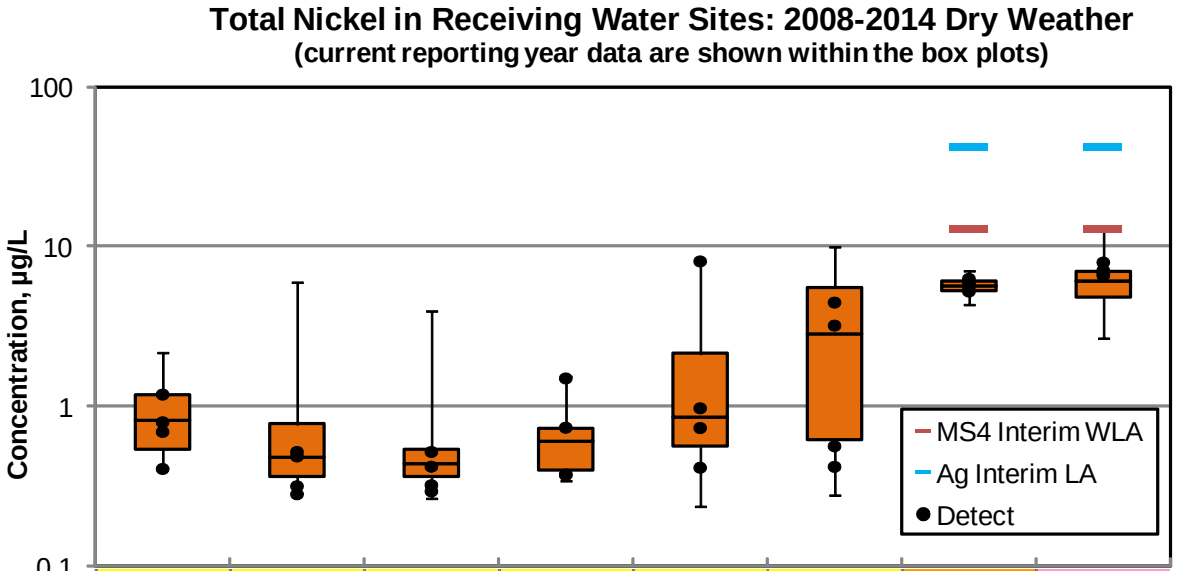
Date	Type	Event	01_BPT_14	01_BPT_15	01_BPT_3	01_BPT_6	01_SG_74	01_RR_BR	03_UNIV	04_WOOD
Aug-13	Dry	39	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nov-13	Dry	40	*0.0007*	<0.0005	<0.0005	0.001	0.0034	*0.0005*	*0.0007*	0.0023
Feb-14	Dry	41	*0.0007*	<0.0005	<0.0005	<0.0005	<0.0005	0.0011	<0.0005	<0.0005
Feb-14	Storm	42						0.0017	0.0019	0.0025
May-14	Dry	43	0.0014	<0.0005	<0.0005	0.0012	0.0038	0.0032	0.0037	0.0017

Figure 31. Total Mercury Concentrations in Receiving Water Sites: 2008-2014



Date	Type	Event	04D_VENTURA	09BD_ADOLF	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	<0.0005	<0.0005	<0.0005			<0.0005		<0.0005	<0.0005	<0.0039
Nov-13	Dry	40	0.0022	0.003	0.0041	0.0057	0.0016	0.0015		0.0016	<0.0005	<0.0039
Feb-14	Dry	41	<0.0005	<0.0005	<0.0005	*0.0007*		<0.0005		0.0013	*0.0006*	<0.0039
Feb-14	Storm	42	0.0047	0.0075	0.0025	0.0019	0.0033	0.0061	0.0091			
May-14	Dry	43	0.0043	0.0048	0.0031	0.0035		0.0043	0.0181	0.0019	<0.0005	<0.0039

Figure 32. Total Mercury Concentrations in Urban and Ag Sites: 2008-2014



Date	Event	01_BPT_14	01_BPT_15	01_BPT_3	01_BPT_6	01_SG_74	01_RR_BR	03_UNIV	04_WOOD
Aug-13	39	0.8126	0.3244	0.3289	0.3803	0.7491	0.4286	6.4	6.7
Nov-13	40	0.4154	0.4972	0.4295	1.5278	8.2161	0.5757	5.33	8.09
Feb-14	41	0.7076	0.2886	0.3011	0.3841	0.4227	3.2635	5.46	6.93
May-14	43	1.2118	0.5306	0.5311	0.7523	0.9942	4.5486	5.97	7.21

Figure 33. Total Nickel Dry Weather Concentrations in Receiving Water Sites: 2008-2014

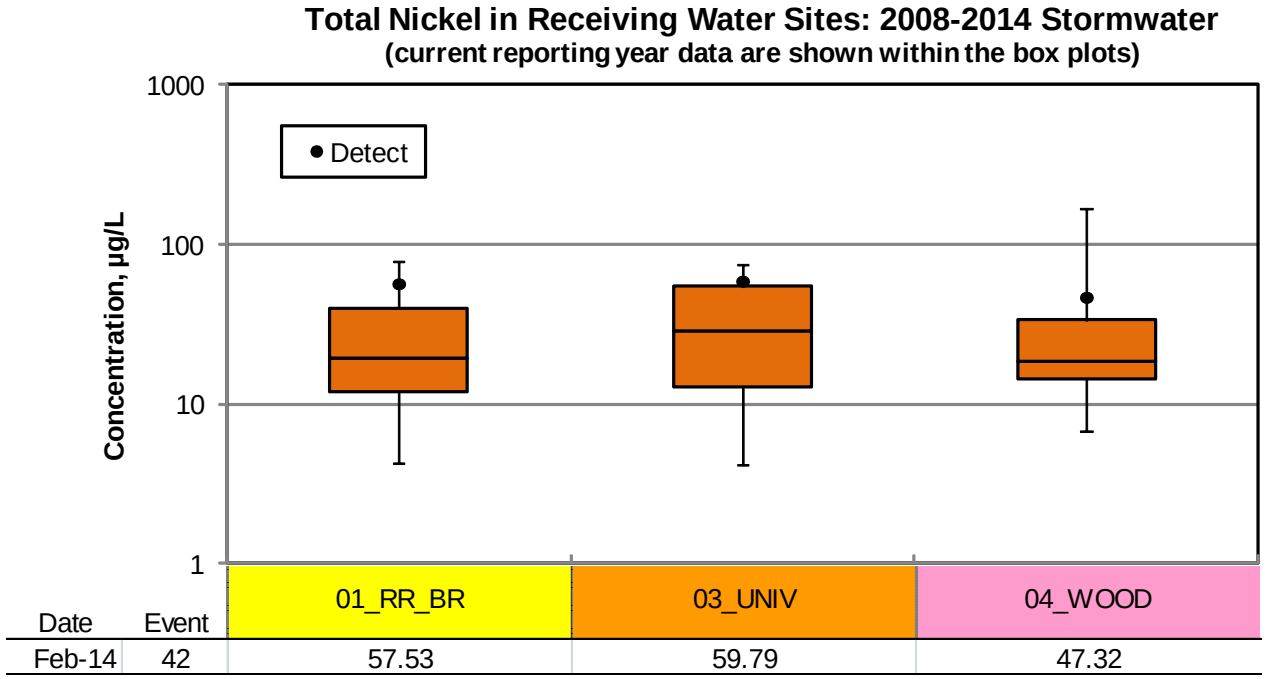
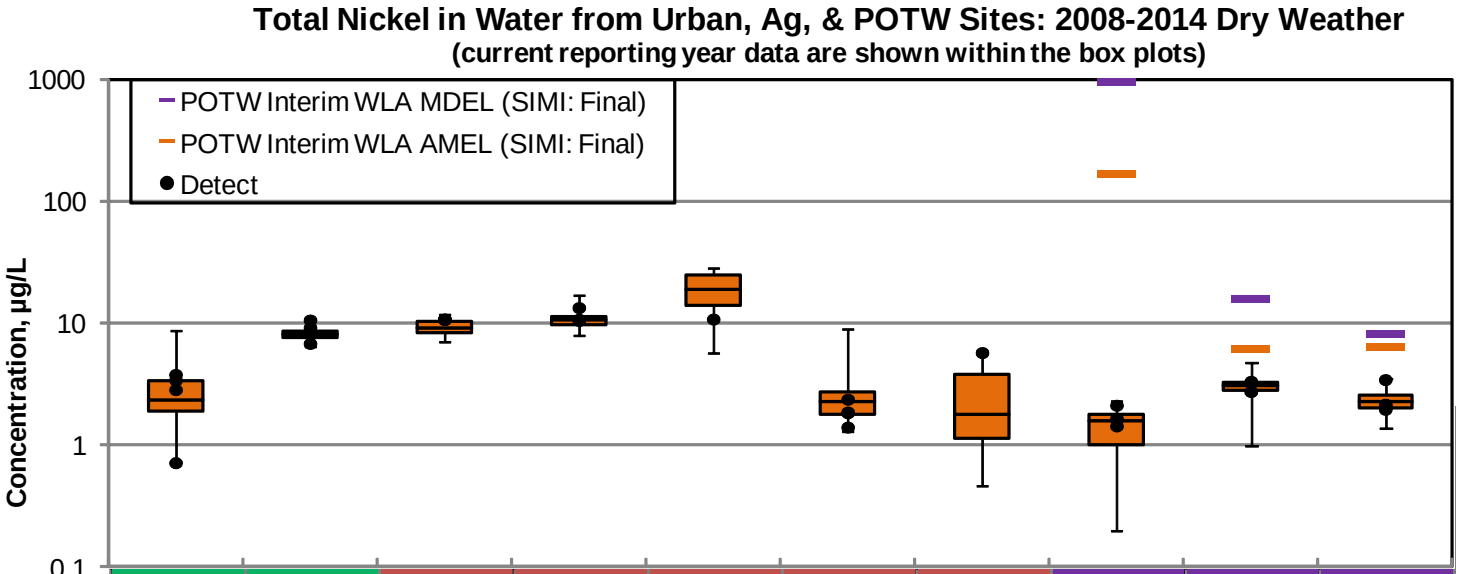


Figure 34. Total Nickel Stormwater Concentrations in Receiving Water Sites: 2008-2014



Date	Event	04D_VENTURA	09BD_ADOLF	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	39	0.73	8.5	10.97			1.43		2.16	3.39	2.2
Nov-13	40	3.47	10.77	10.95	10.68	10.97	2.42		1.64	3.34	2.1
Feb-14	41	3.86	9.35	10.87	13.61		1.9		1.68	2.81	3.5
May-14	43	2.9	6.93	10.89	10.93		1.87	5.83	1.46	2.8	2

Figure 35. Total Nickel Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2014

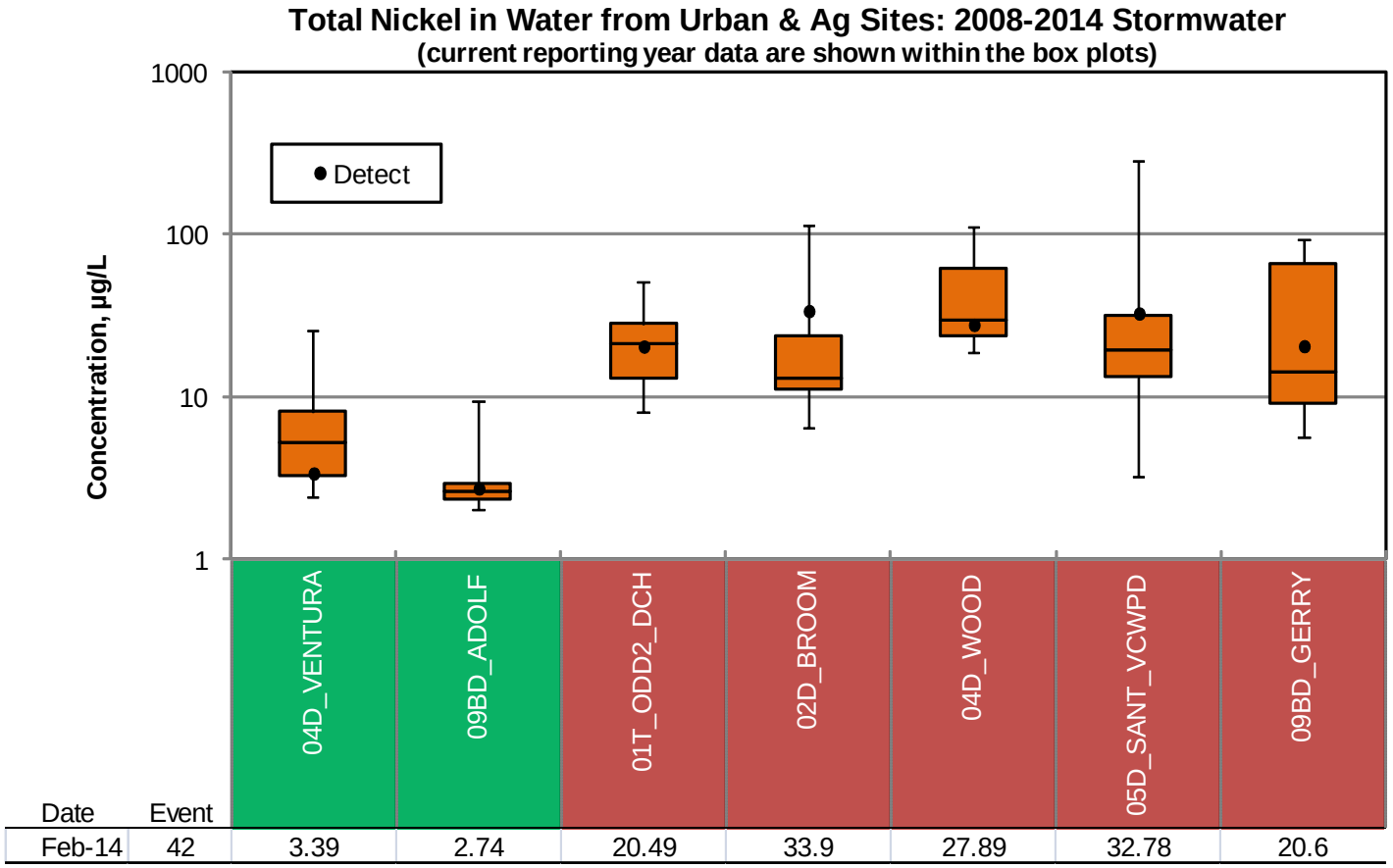
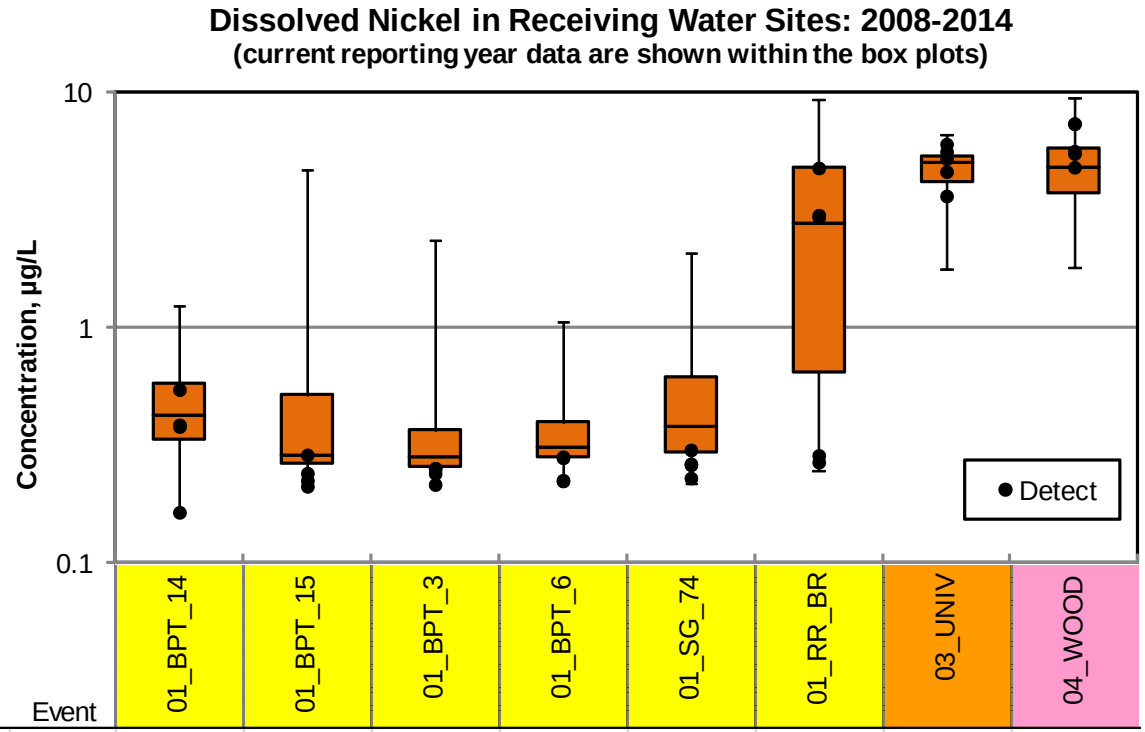
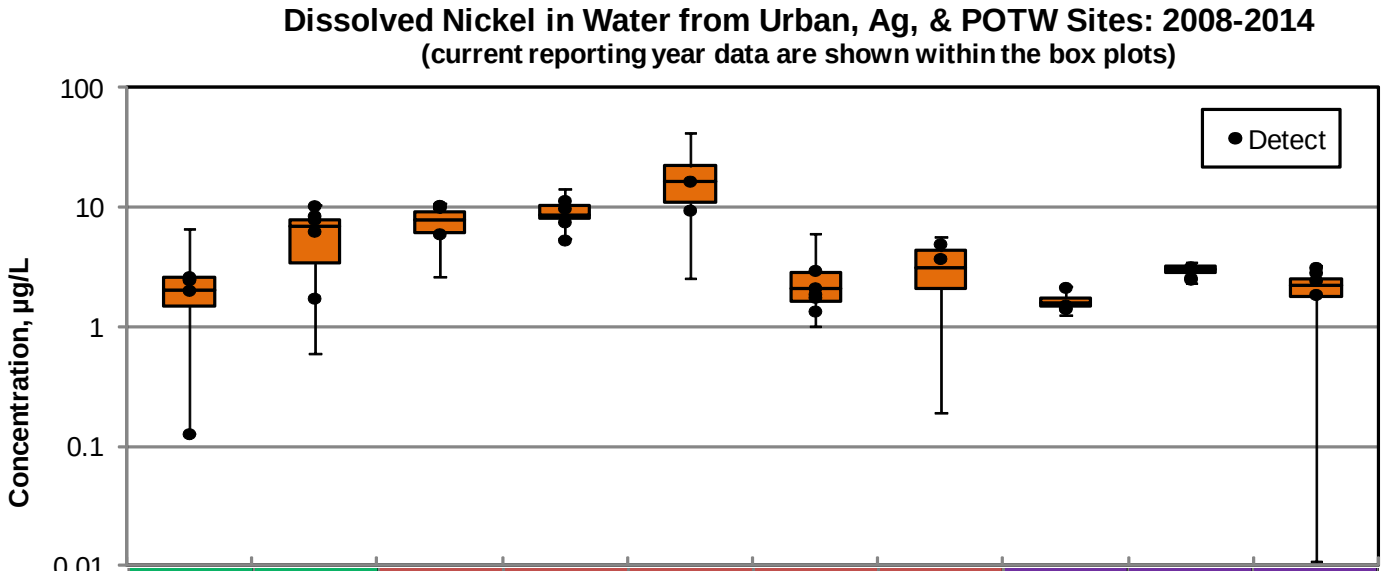


Figure 36. Total Nickel Stormwater Concentrations in Urban and Ag Sites: 2008-2014



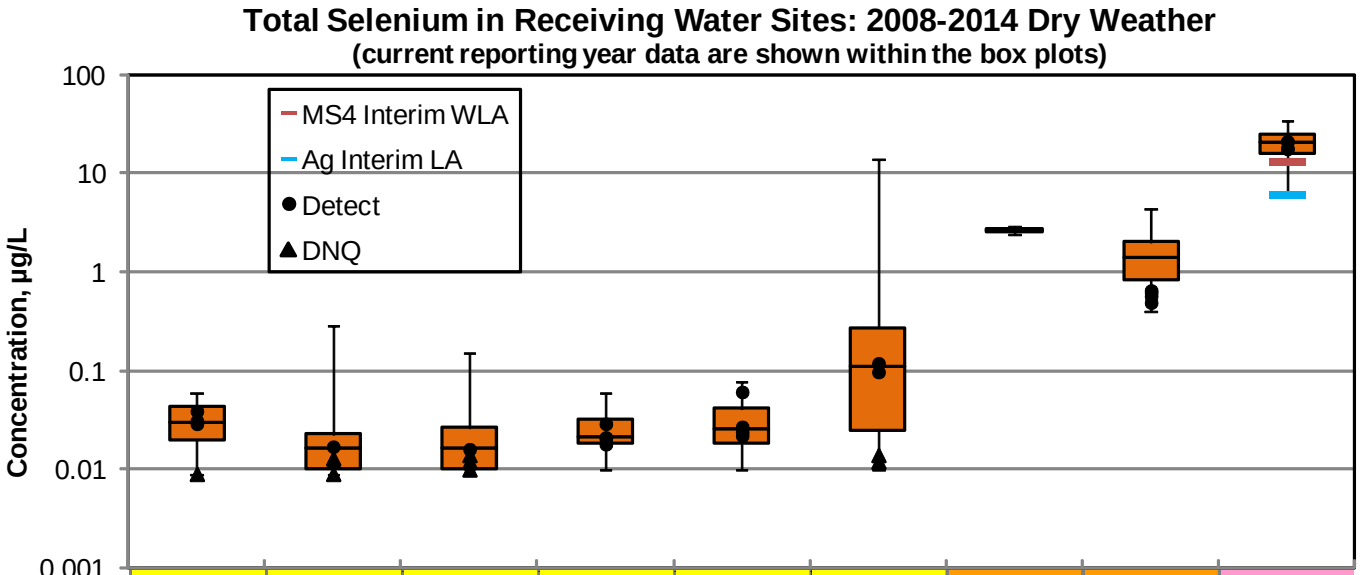
Date	Type	Event	01_BPT_14	01_BPT_15	01_BPT_3	01_BPT_6	01_SG_74	01_RR_BR	03_UNIV	04_WOOD
Aug-13	Dry	39	0.38	0.22	0.22	0.22	0.26	0.27	6.01	5.61
Nov-13	Dry	40	0.16	0.24	0.24	0.28	0.26	0.29	5.21	7.35
Feb-14	Dry	41	0.39	0.21	0.25	0.22	0.23	2.94	4.59	5.48
Feb-14	Storm	42						4.76	3.62	4.79
May-14	Dry	43	0.54	0.29	0.25	0.28	0.30	3.00	5.58	7.33

Figure 37. Dissolved Nickel Concentrations in Receiving Water Sites: 2008-2014



Date	Type	Event	04D_VENTURA	09BD_ADOLF	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	0.13	8.07	10.2			1.38		2.18	3.24	2.90
Nov-13	Dry	40	2.06	10.5	10.3	7.69	9.65	2.16		1.55	3.16	2.50
Feb-14	Dry	41	2.58	8.67	10.5	11.6		1.92		1.45	2.55	3.20
Feb-14	Storm	42	2.68	1.77	6.11	5.42	16.9	3.02	3.80			
May-14	Dry	43	2.52	6.42	10.6	10.0		1.80	5.04	1.46	2.63	1.90

Figure 38. Dissolved Nickel Concentrations in Urban, Ag, and POTW Sites: 2008-2014



Date	Event	01_BPT_14	01_BPT_15	01_BPT_3	01_BPT_6	01_SG_74	01_RR_BR	02_PCH	03_UNIV	04_WOOD
Aug-13	39	0.031	*0.012*	*0.01*	0.018	0.022	*0.012*		0.65	**17.7**
Nov-13	40	*0.009*	*0.013*	*0.014*	0.029	0.061	*0.014*		0.49	**17.8**
Feb-14	41	0.029	*0.009*	*0.012*	0.021	0.027	0.097		0.57	**21.0**
May-14	43	0.039	0.017	0.016	0.021	0.024	0.119		0.62	**21.0**

Figure 39. Total Selenium Dry Weather Concentrations in Receiving Water Sites: 2008-2014

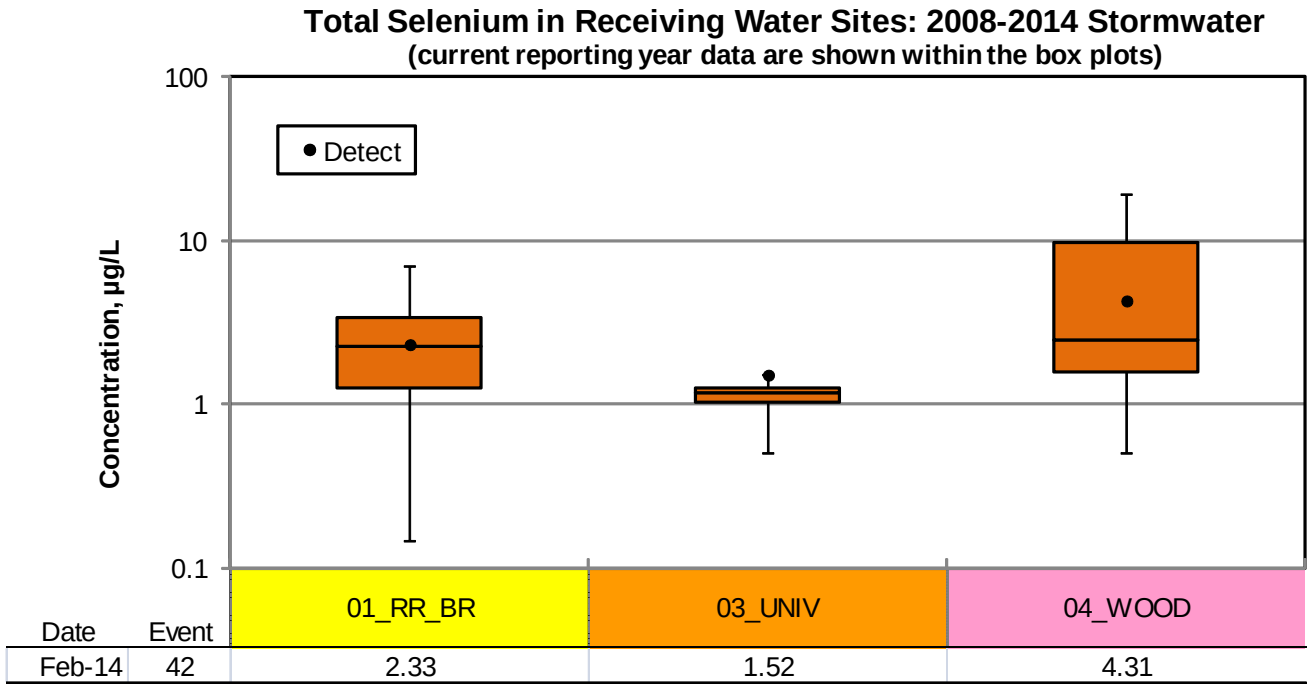
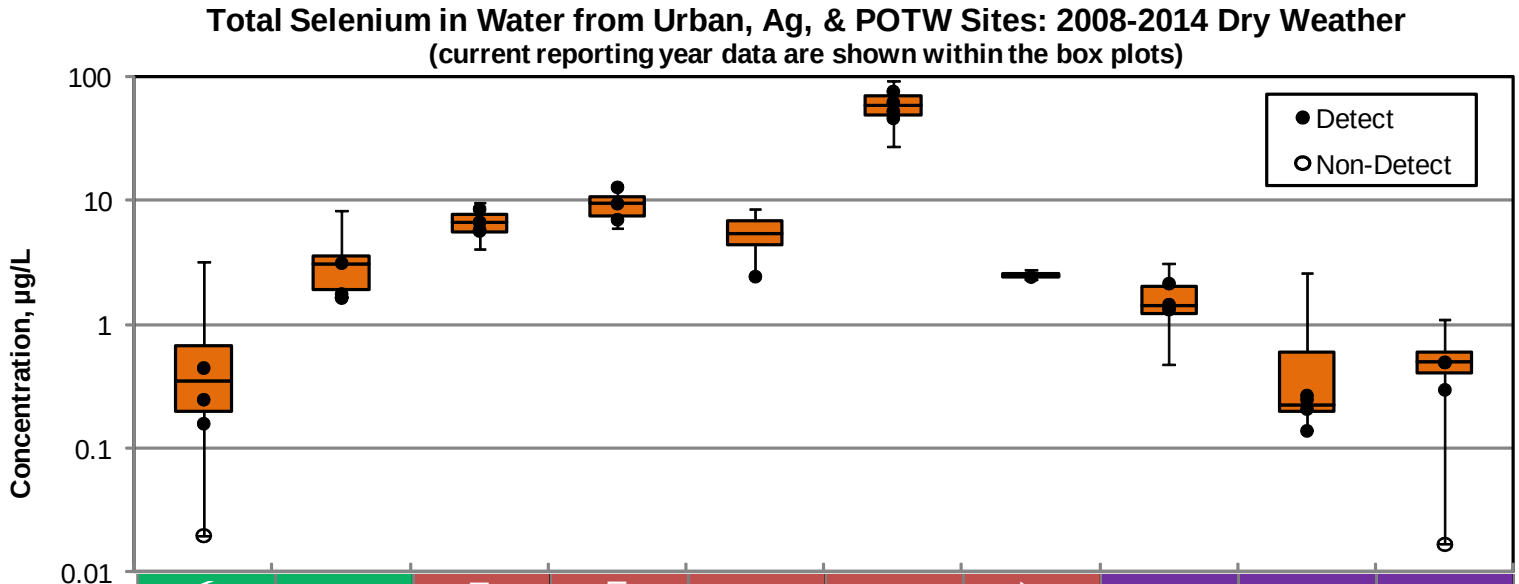


Figure 40. Total Selenium Stormwater Concentration in Receiving Water Sites: 2008-2014



Date	Event	04D_VENTURA	09BD_ADOLF	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	39	<0.020	1.65	5.74			46.51		1.38	0.21	<0.017
Nov-13	40	0.16	3.16	5.85	7.08	2.46	62.6		1.46	0.14	0.3
Feb-14	41	0.25	1.67	8.6	12.9		53.03		2.16	0.27	0.5
May-14	43	0.45	1.78	6.77	9.53		76.56	2.44	1.33	0.25	0.5

Figure 41. Total Selenium Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2014

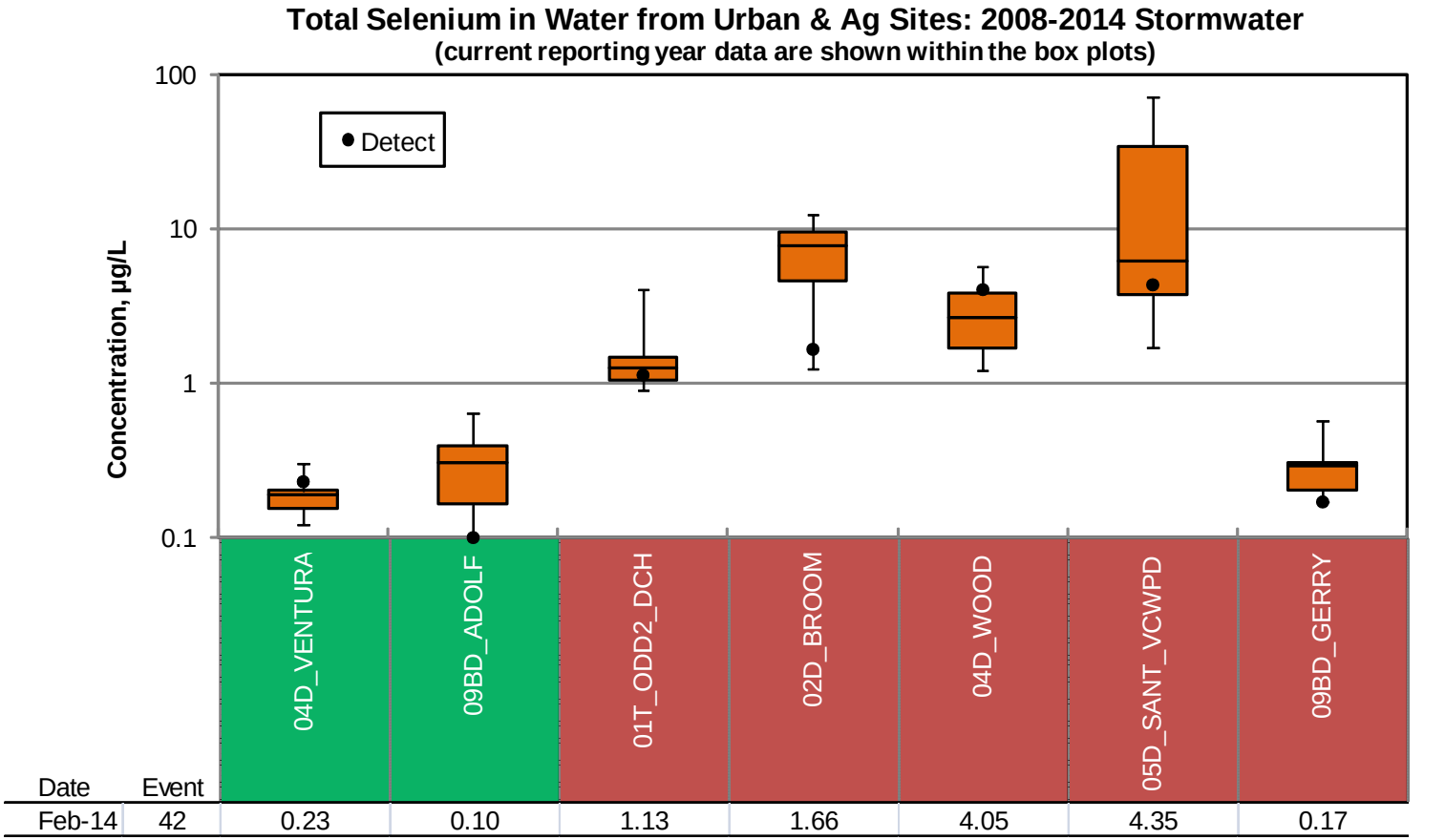
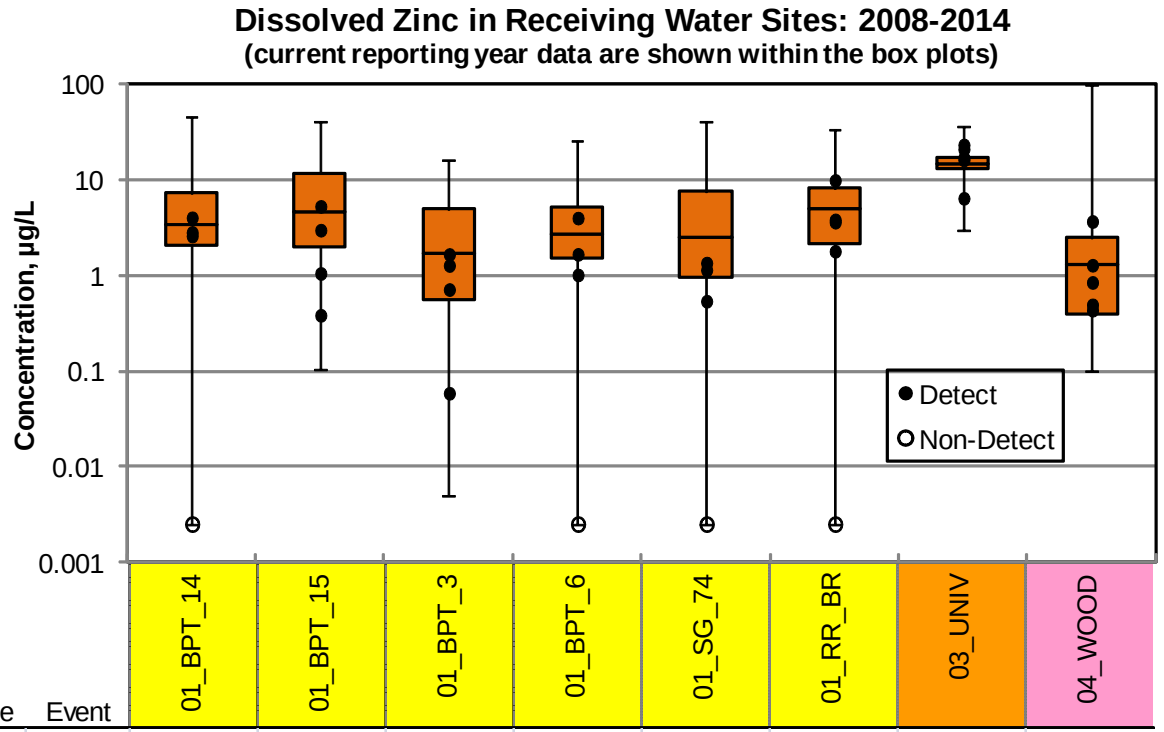
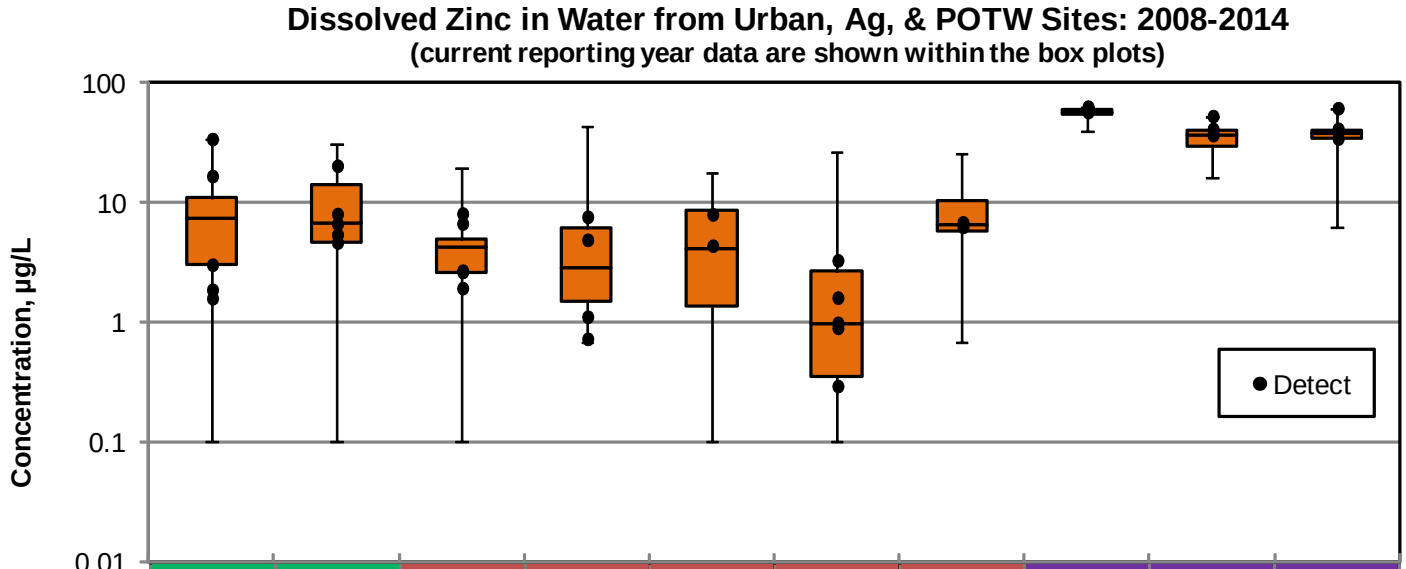


Figure 42. Total Selenium Stormwater Concentrations in Urban and Ag Sites: 2008-2014



Date	Type	Event	01_BPT_14	01_BPT_15	01_BPT_3	01_BPT_6	01_SG_74	01_RR_BR	03_UNIV	04_WOOD
Aug-13	Dry	39	<0.0025	2.9556	0.0583	<0.0025	<0.0025	<0.0025	16.03	0.43
Nov-13	Dry	40	2.7994	5.2434	1.6458	1.6511	1.3391	9.7821	20.75	0.84
Feb-14	Dry	41	3.9815	0.3809	1.2631	3.9557	0.5345	3.7898	23	0.49
Feb-14	Storm	42						3.58	6.37	3.64
May-14	Dry	43	2.5692	1.0437	0.7071	1.006	1.1334	1.7787	16.95	1.27

Figure 43. Dissolved Zinc Concentrations in Receiving Water Sites: 2008-2014

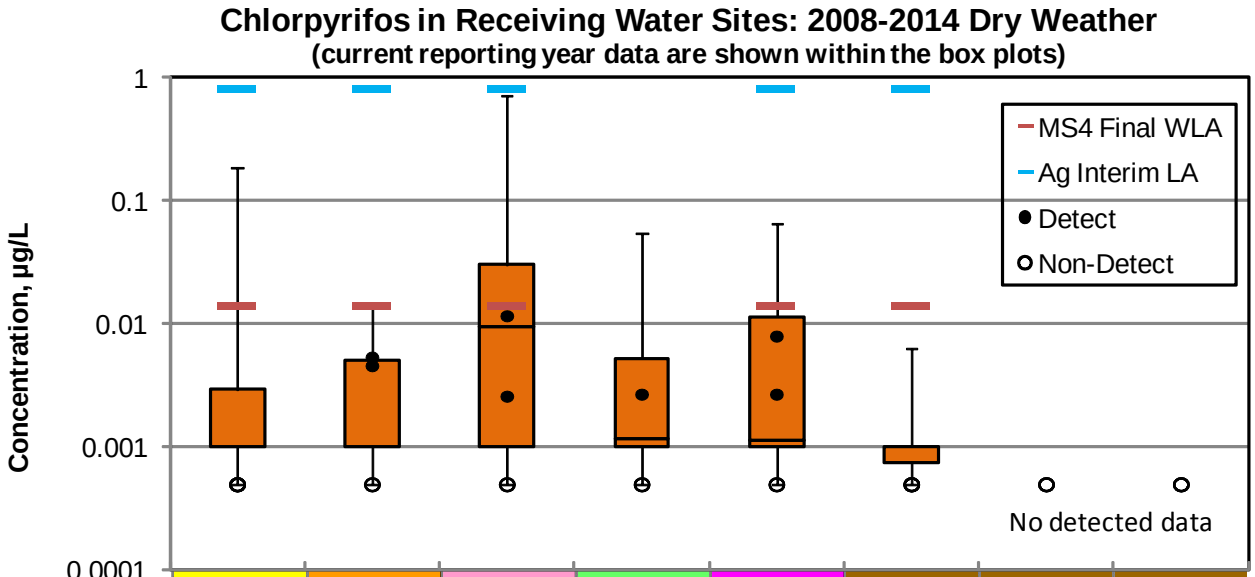


Date	Type	Event	04D_VENTURA	09BD_ADOLF	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	1.57	6.59	8.03			0.29		62.8	36.3	41.0
Nov-13	Dry	40	1.85	4.60	1.91	0.72	7.89	0.89		57.9	40.9	39.0
Feb-14	Dry	41	3.00	5.36	2.61	1.10		0.98		59.1	52.4	61.0
Feb-14	Storm	42	33.6	20.1	6.63	4.84	4.32	3.26	6.22			
May-14	Dry	43	16.5	7.96	2.67	7.53		1.59	6.78	56.5	37.1	34.0

Figure 44. Dissolved Zinc Concentrations in Urban, Ag, and POTW Sites: 2008-2014

TOXICITY TMDL

For the Toxicity TMDL, urban dischargers' final WLAs are effective as well as interim LAs for agricultural dischargers. The compliance points for these allocations are in the receiving waters at the base of the subwatersheds and are shown on the box plots for the appropriate site locations. Data for chlorpyrifos and diazinon has been separated into dry weather and stormwater since the allocations differ for the two conditions. Bolded values in the tables within each figure indicate the concentration was above the applicable limits for that constituent. Italicized values in the tables within each figure indicate the concentration was DNQ. Values in the tables within each figure with a "<" preceding them, indicate the constituent was ND at the MDL for that constituent.



Date	Event	01_RR_BR	03_UNIV	04_WOOD	06_SOMIS	07_HITCH	09B_ADOLF	10_GATE	13_BELT
Aug-13	39	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nov-13	40	<0.0005	<0.0005	0.0026	<0.0005	<0.0005	<0.0005		<0.0005
Feb-14	41	<0.0005	0.0054	0.0117	0.0027	0.008	<0.0005	<0.0005	
May-14	43	<0.0005	0.0046	<0.0005		0.0027	<0.0005	<0.0005	<0.0005

Figure 45. Chlorpyrifos Dry Weather Concentrations in Receiving Water Sites: 2008-2014

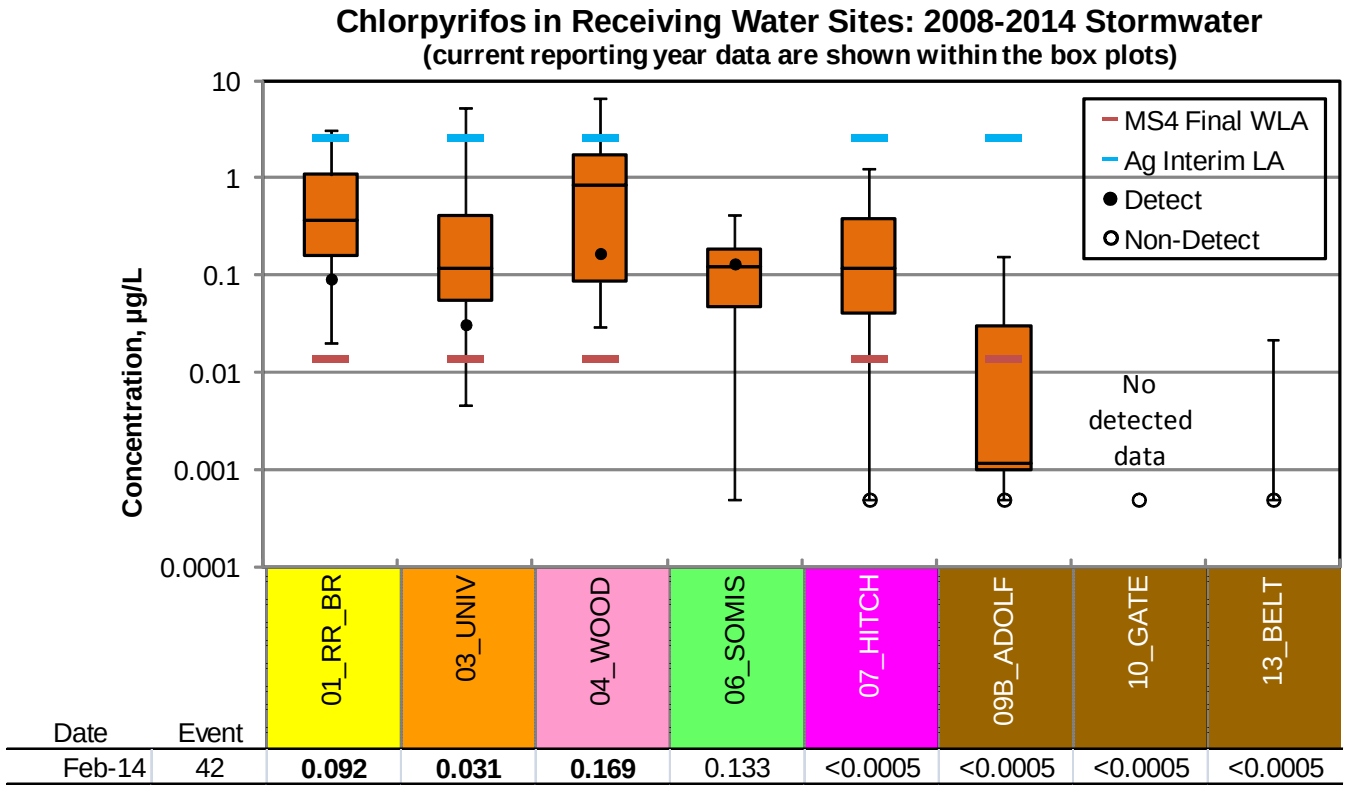
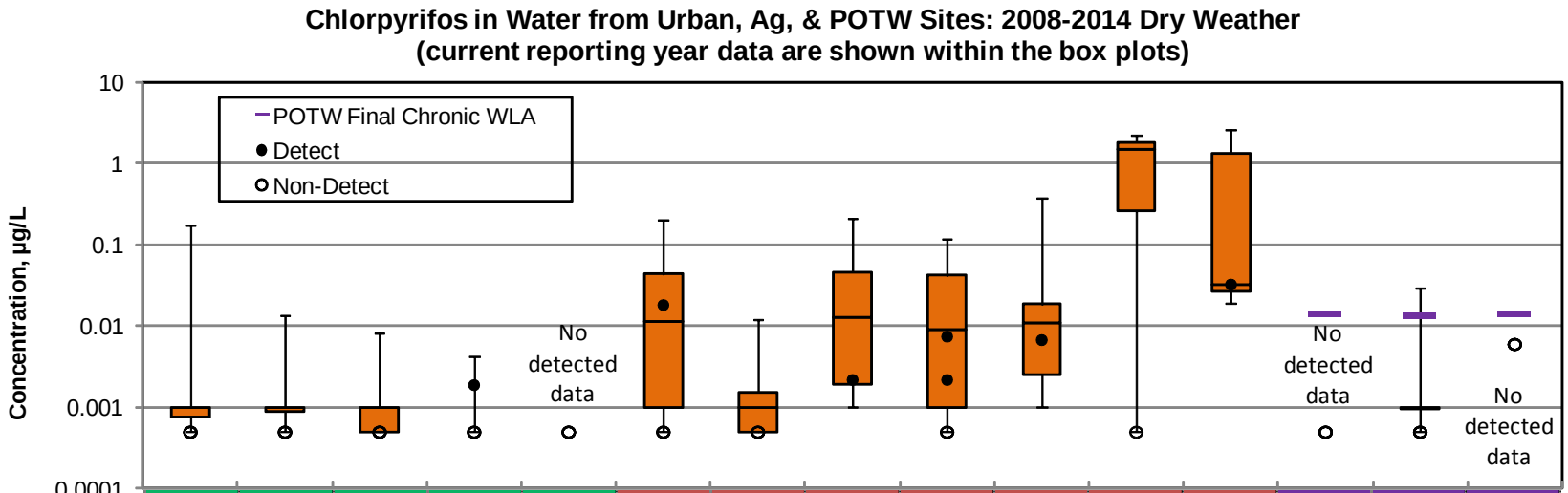


Figure 46. Chlorpyrifos Stormwater Concentrations in Receiving Water Sites: 2008-2014



Date	Event	04D_VENTURA	07D_CTP	07T_DC_H	09BD_ADOLF	13_SB_HILL	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	39	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			<0.0005				<0.0005	<0.0005	<0.006
Nov-13	40	<0.0005	<0.0005	<0.0005	0.0019	<0.0005	<0.0005	<0.0005	0.0022	0.0075	0.0068			<0.0005	<0.0005	<0.006
Feb-14	41	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0183	<0.0005		0.0022				<0.0005	<0.0005	<0.006
May-14	43	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005		<0.0005	0.0327	<0.0005	<0.0005	<0.006

Figure 47. Chlorpyrifos Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2014

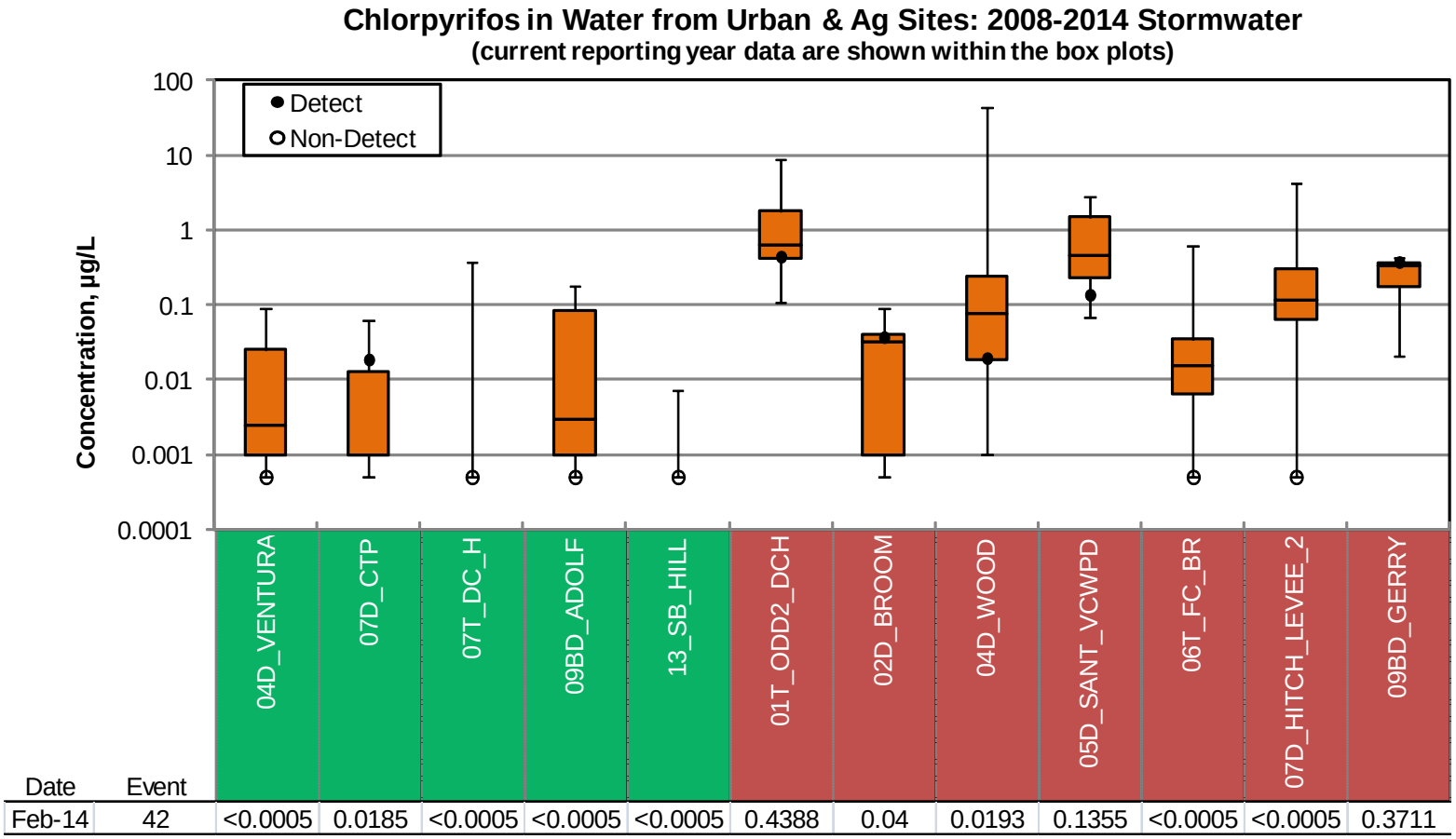
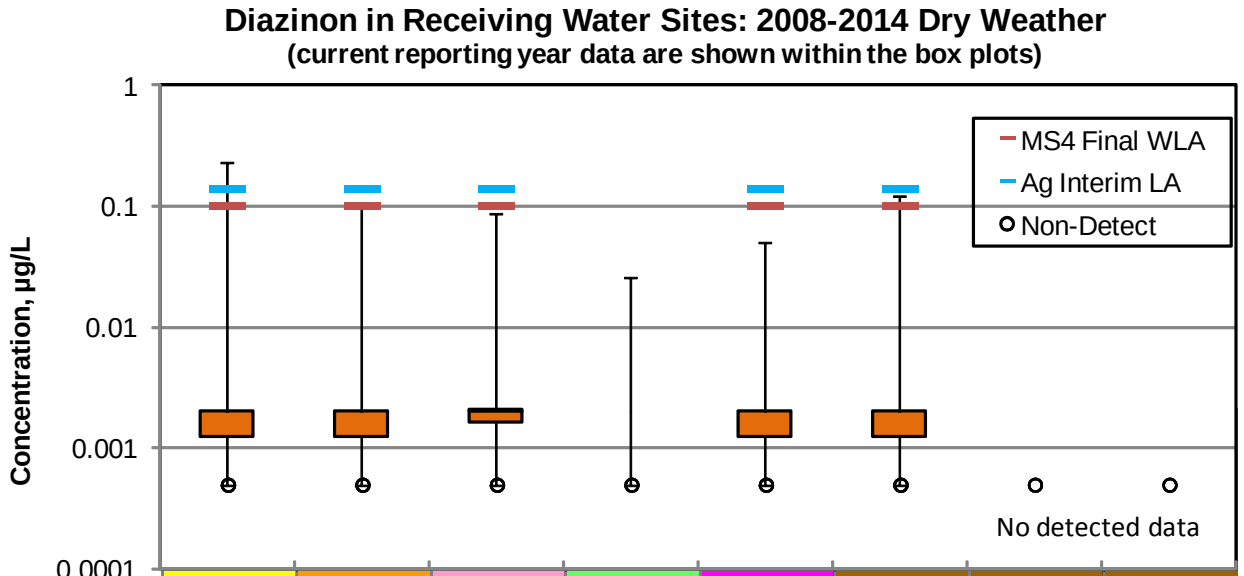


Figure 48. Chlorpyrifos Stormwater Concentrations in Urban and Ag Sites: 2008-2014



Date	Event	01_RR_BR	03_UNIV	04_WOOD	06_SOMIS	07_HITCH	09B_ADOLF	10_GATE	13_BELT
Aug-13	39	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nov-13	40	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005
Feb-14	41	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
May-14	43	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005

Figure 49. Diazinon Dry Weather Concentrations in Receiving Water Sites: 2008-2014

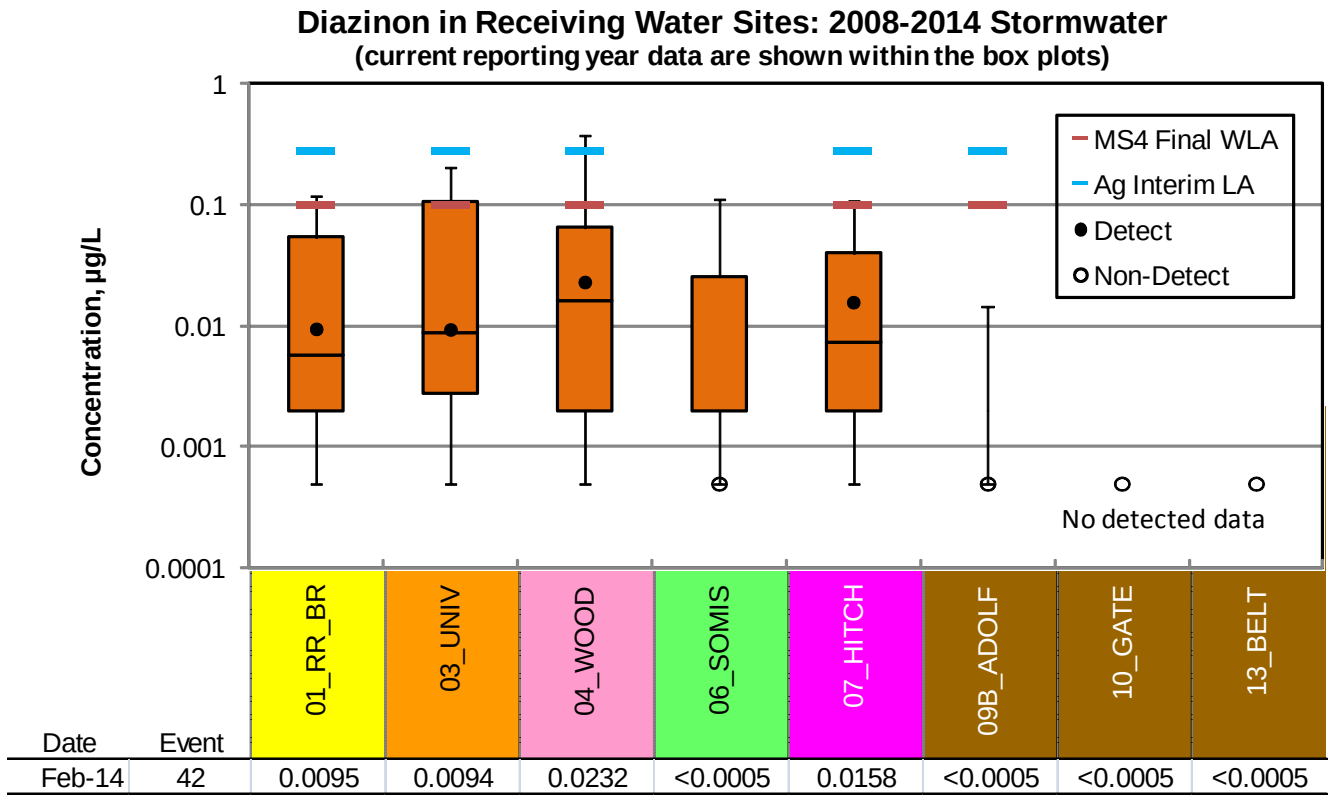
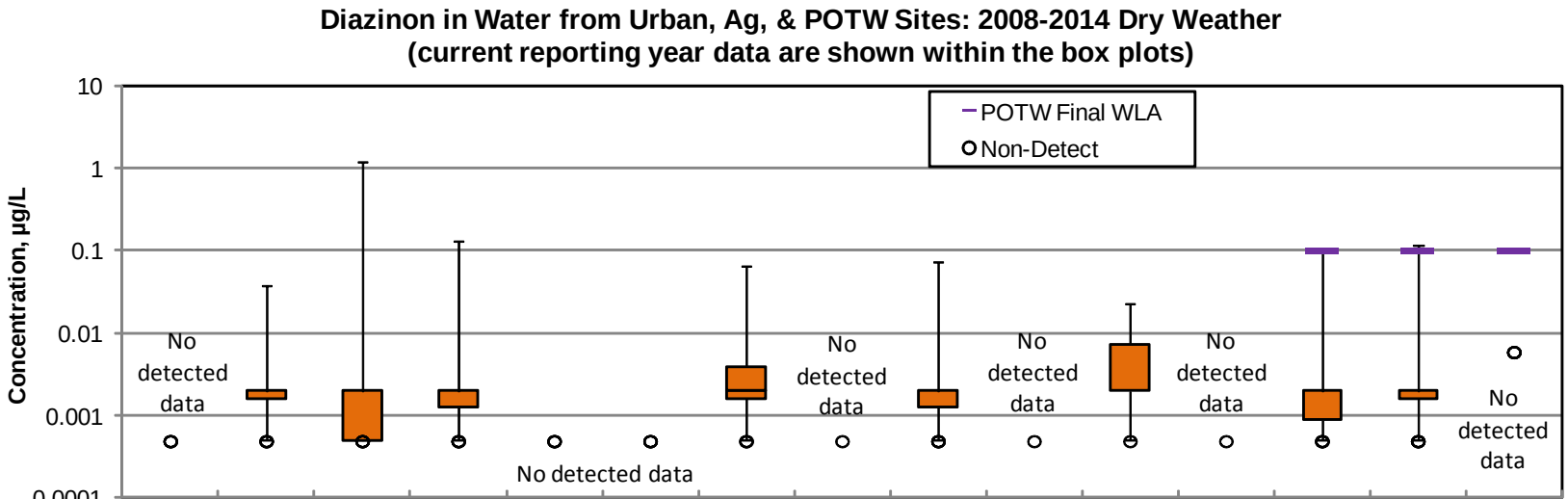


Figure 50. Diazinon Stormwater Concentrations in Receiving Water Sites: 2008-2014



Date	Event	04D_VENTURA	07D_CTP	07T_DC_H	09BD_ADOLF	13_SB_HILL	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	39	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			<0.0005				<0.0005	<0.0005	<0.006
Nov-13	40	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			<0.0005	<0.0005	<0.006
Feb-14	41	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005				<0.0005	<0.0005	<0.006
May-14	43	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.006

Figure 51. Diazinon Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2014

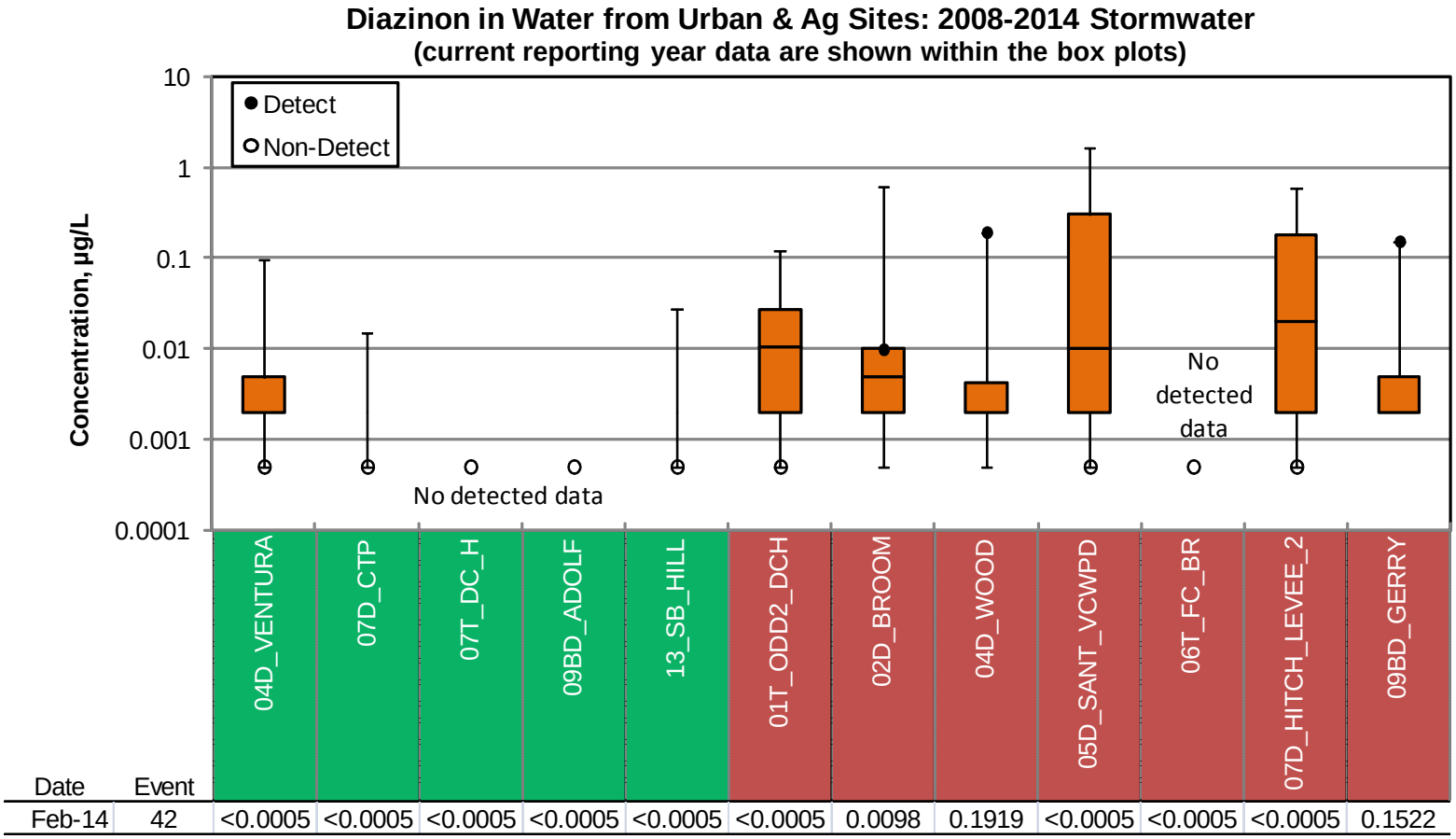
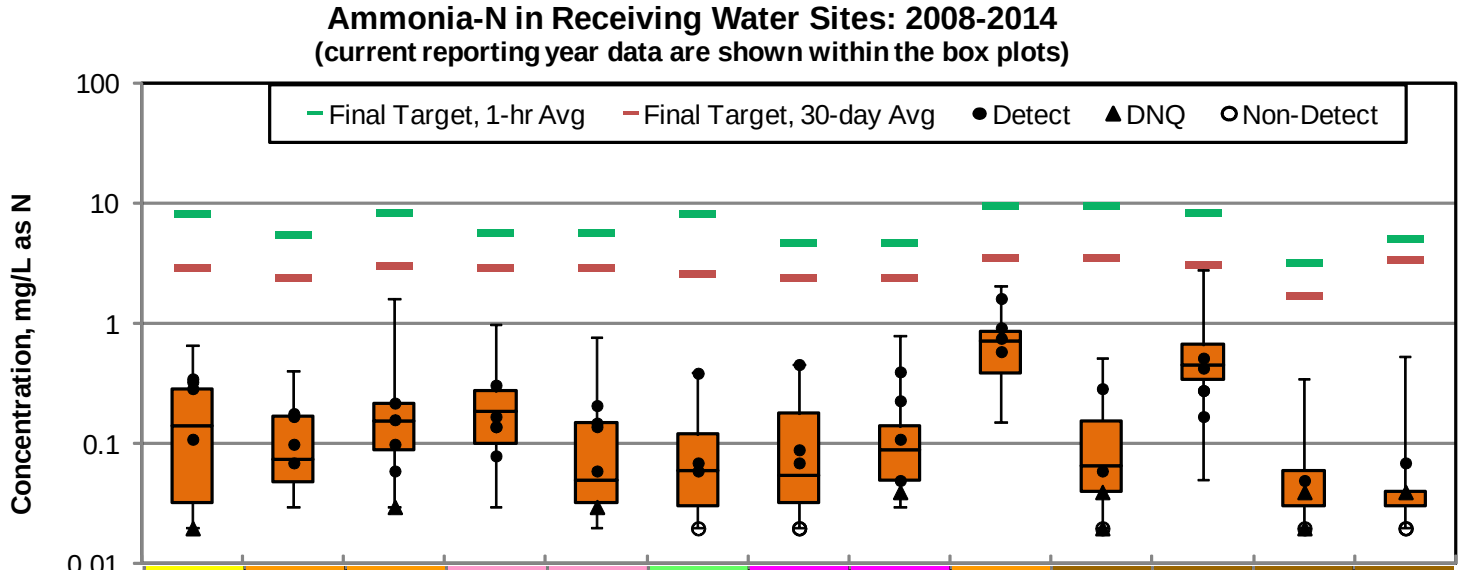


Figure 52. Diazinon Stormwater Concentrations in Urban and Ag Sites: 2008-2014

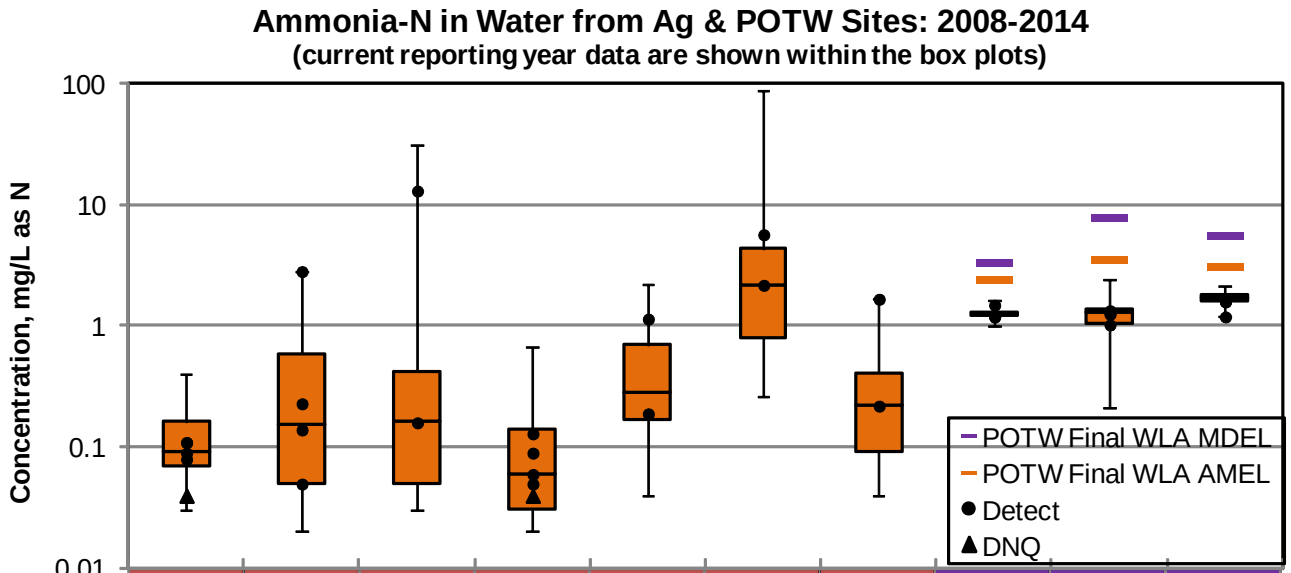
NUTRIENTS TMDL

Final targets and allocations are effective for the Nutrients TMDL. The applicable targets for each monitoring site are presented in the figures below. Bolded values in the tables within each figure indicate the concentration was above the applicable limits for that constituent. Italicized values in the tables within each figure indicate the concentration was DNQ. Values in the tables within each figure with a "<" preceding them, indicate the constituent was ND at the MDL for that constituent.



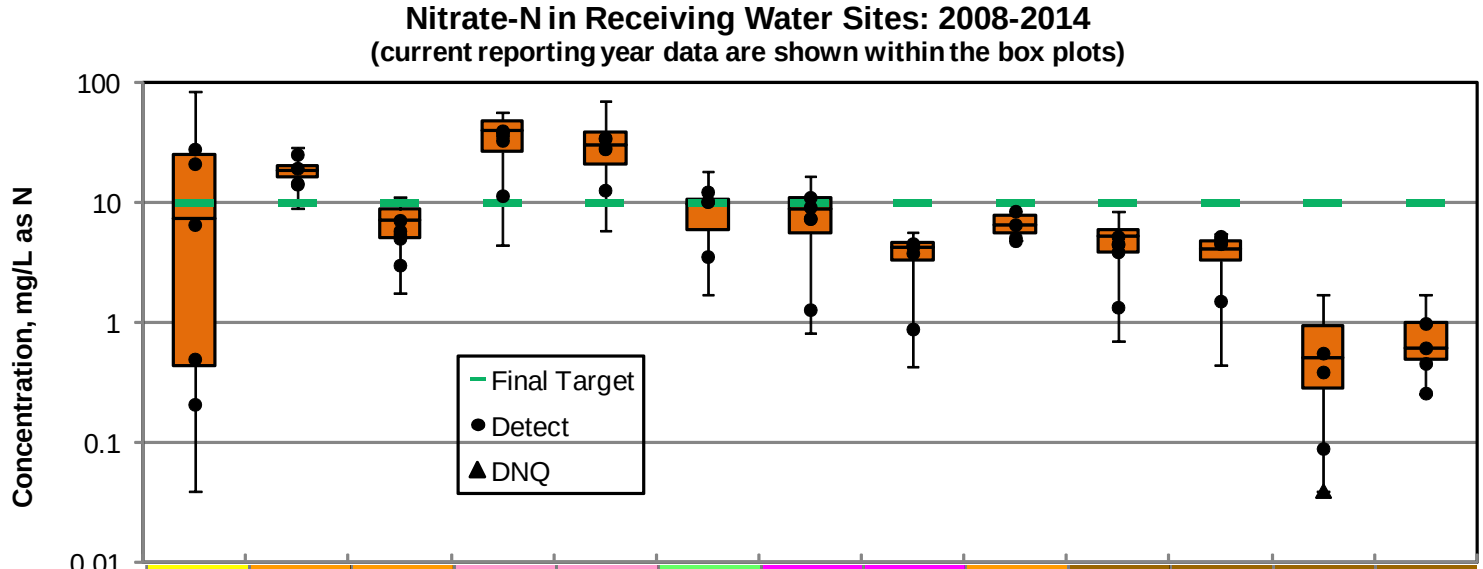
Date	Type	Event	01_RR_BR	02_PCH	03_UNIV	04_WOOD	05_CENTR	06_SOMIS	07_HITCH	07_MADER	09A_HOWAR	09B_ADOLF	10_GATE	12_PARK	13_BELT
Aug-13	Dry	39	0.35	0.18	0.06	0.31	*0.03*	0.07	0.07	0.05	0.76	*0.04*	0.52	<0.02	*0.04*
Nov-13	Dry	40	*0.02*	0.1	0.16	0.17	0.21	0.06	0.09	*0.04*	0.59	0.06	0.43	0.05	0.07
Feb-14	Dry	41	0.11	0.17	0.1	0.14	0.06	<0.02	<0.02	0.23	0.93	*0.02*	0.28	*0.02*	<0.02
Feb-14	Storm	42	0.33		0.22	0.14	0.15	0.39	0.46	0.4		0.29	0.17		
May-14	Dry	43	0.29	0.07	*0.03*	0.08	0.14		<0.02	0.11	1.63	<0.02	0.28	*0.04*	<0.02

Figure 53. Ammonia-N Concentrations in Receiving Water Sites: 2008-2014



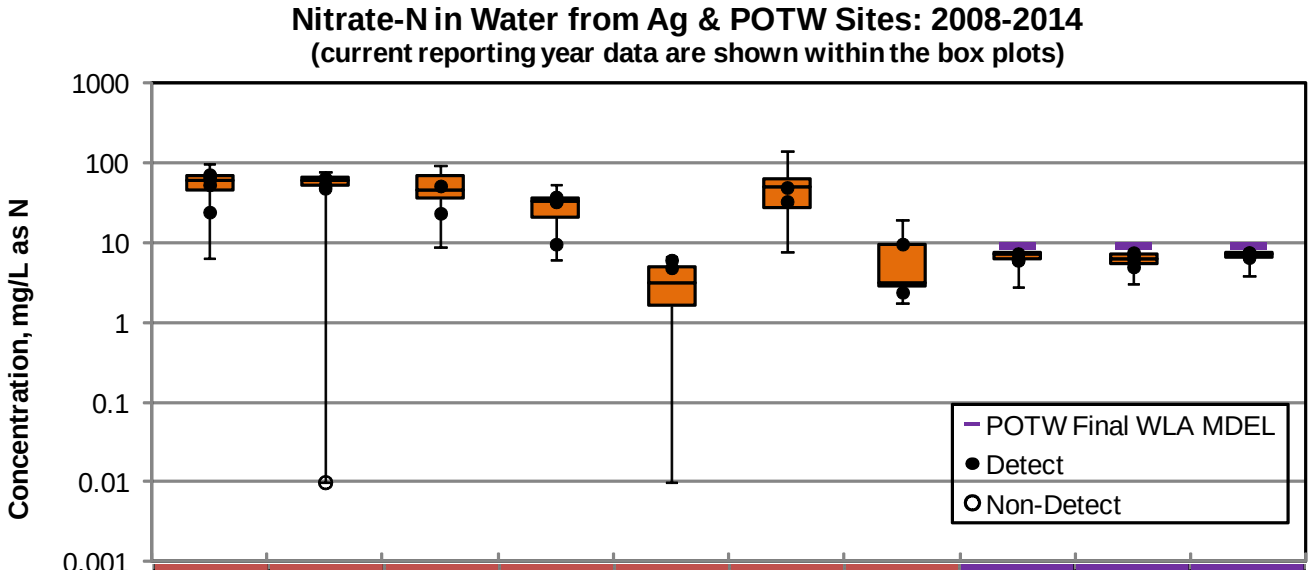
Date	Type	Event	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	0.08			*0.04*				1.2	1.03	1.6
Nov-13	Dry	40	0.09	2.84	13.14	0.06	0.19			1.2	1.35	1.6
Feb-14	Dry	41	*0.04*	0.05		0.05				1.5	1.29	1.2
Feb-14	Storm	42	0.11	0.14	0.16	0.13	1.15	2.19	0.22			
May-14	Dry	43	0.11	0.23		0.09		5.72	1.68		1.26	1.7

Figure 54. Ammonia-N Concentrations in Ag and POTW Sites: 2008-2014



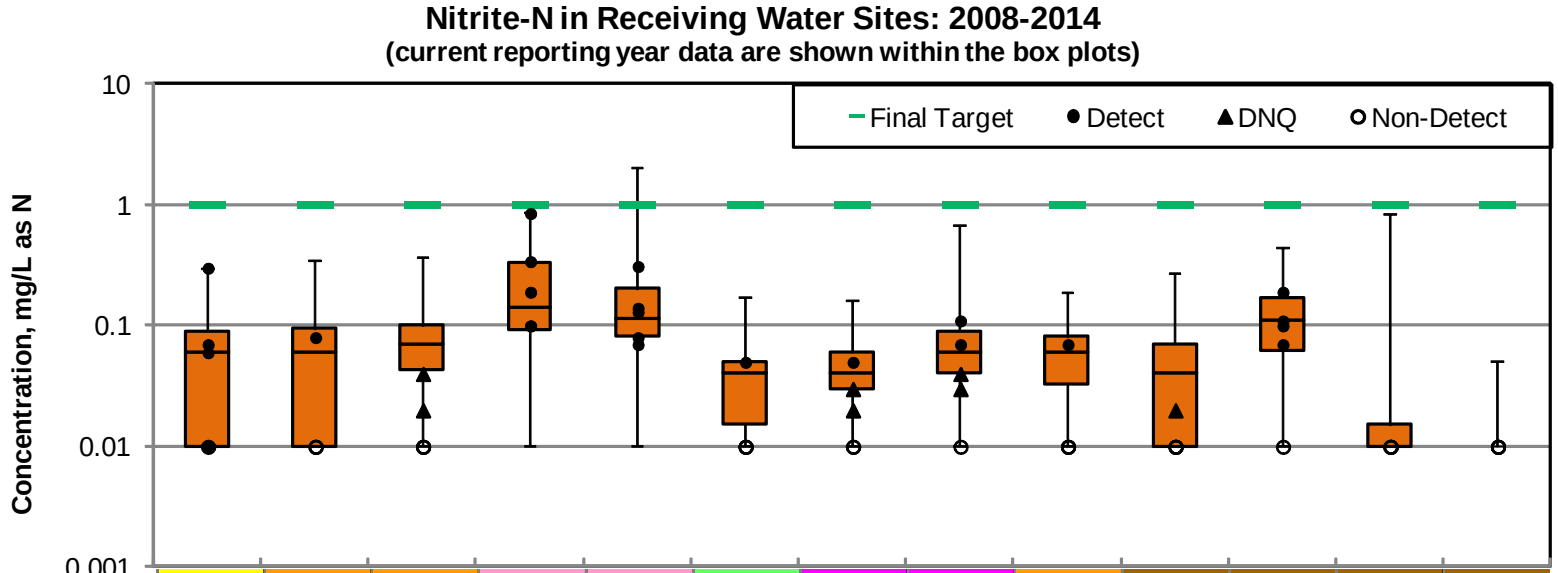
Date	Type	Event	01_RR_BR	02_PCH	03_UNIV	04_WOOD	05_CENTR	06_SOMIS	07_HITCH	07_MADER	09A_HOWAR	09B_ADOLF	10_GATE	12_PARK	13_BELT
Aug-13	Dry	39	0.21	**14.5**	5.06	**38.9**	**34.8**	**12.4**	7.4	4.34	4.83	4.56	5.01	*0.04*	0.46
Nov-13	Dry	40	0.5	**14.3**	5.85	**36.3**	**28.2**	**10.3**	7.41	4.58	6.58	4.52	4.56	0.56	0.99
Feb-14	Dry	41	**21.2**	**19.5**	7.16	**33.1**	**28.9**	**10.2**	9.23	4.38	8.52	5.24	4.67	0.39	0.62
Feb-14	Storm	42	6.6		3.03	**11.5**	**12.8**	3.57	1.29	0.89		1.35	1.52		
May-14	Dry	43	**28.1**	**25.3**	5.46	**39.8**	**34.4**		**11.1**	3.82	5.13	3.91	5.27	0.09	0.26

Figure 55. Nitrate-N Concentrations in Receiving Water Sites: 2008-2014



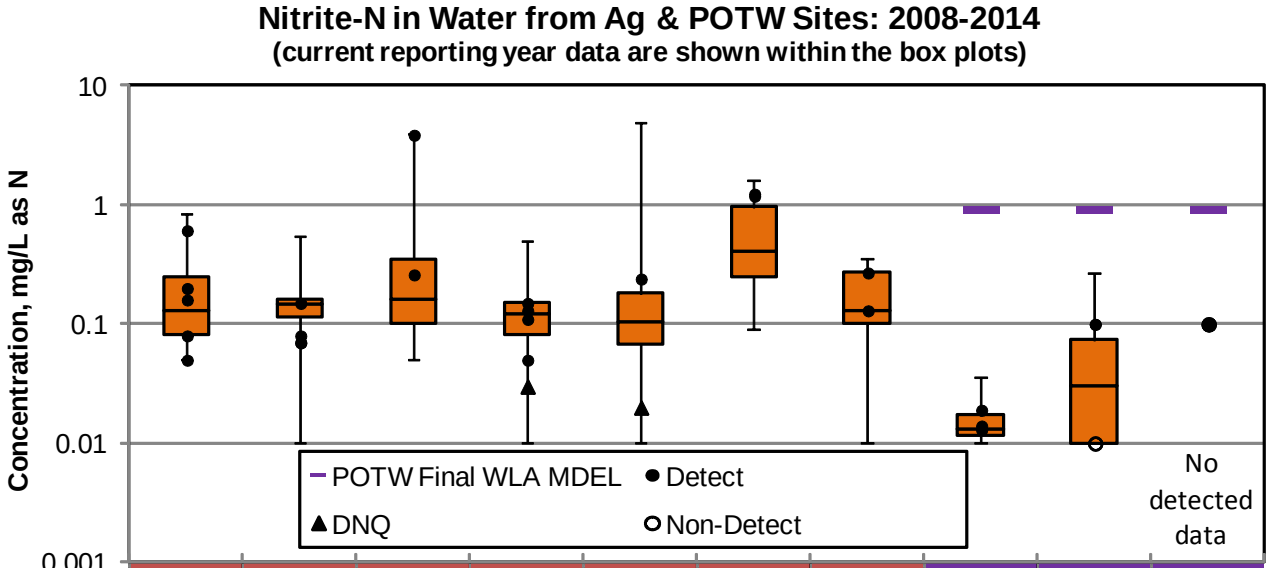
Date	Type	Event	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	53.1			32.5				7.30	4.97	7.50
Nov-13	Dry	40	69.1	48.0	23.4	37.4	4.85			6.10	6.25	6.50
Feb-14	Dry	41	71.0	64.6		33.8				6.00	7.50	7.50
Feb-14	Storm	42	24.1	<0.01	51.4	9.58	6.06	49.1	2.39			
May-14	Dry	43	62.6	52.7		33.7		32.9	9.61		7.00	7.20

Figure 56. Nitrate-N Concentrations in Ag and POTW Sites: 2008-2014



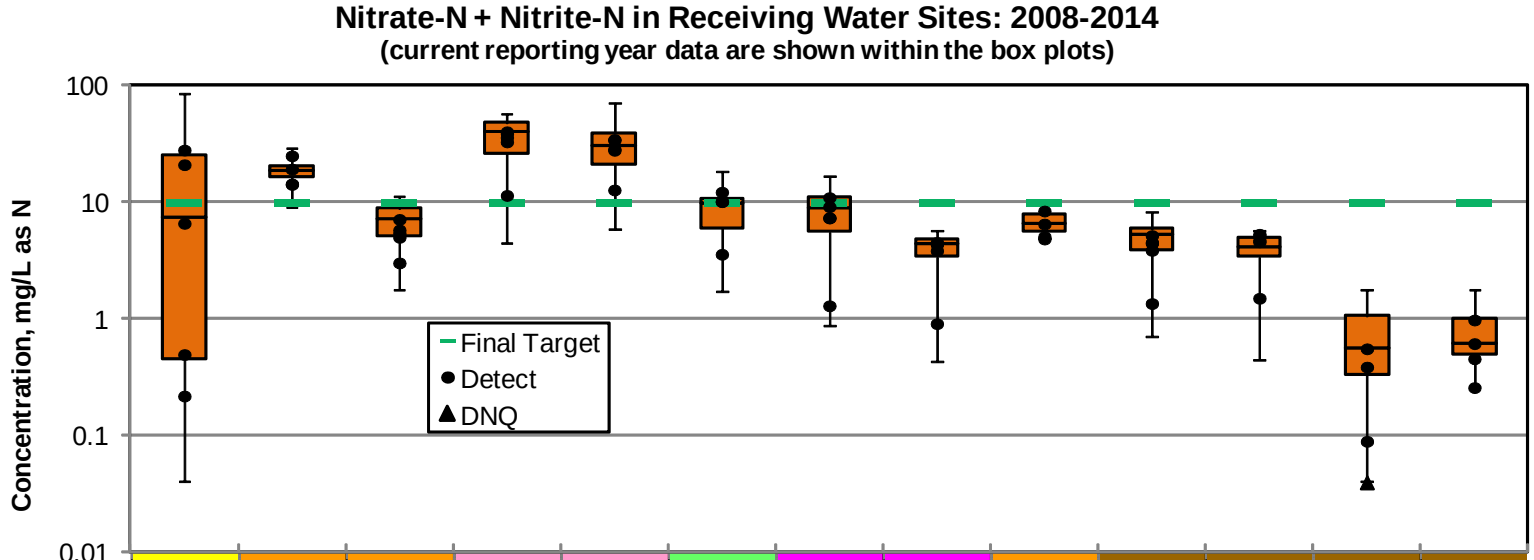
Date	Type	Event	01_RR_BR	02_PCH	03_UNIV	04_WOOD	05_CENTR	06_SOMIS	07_HITCH	07_MADER	09A_HOWAR	09B_ADOLF	10_GATE	12_PARK	13_BELT
Aug-13	Dry	39	0.01	<0.01	<0.01	0.34	0.14	<0.01	0.05	0.11	0.07	<0.01	0.19	<0.01	<0.01
Nov-13	Dry	40	<0.01	0.08	<0.01	0.1	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	<0.01
Feb-14	Dry	41	0.06	<0.01	*0.04*	0.19	0.08	<0.01	*0.03*	*0.04*	<0.01	<0.01	0.1	<0.01	<0.01
Feb-14	Storm	42	0.07		*0.02*	0.1	0.13	0.05	*0.02*	*0.03*		*0.02*	<0.01		
May-14	Dry	43	0.3	<0.01	<0.01	0.85	0.31		<0.01	0.07	<0.01	<0.01	0.11	<0.01	<0.01

Figure 57. Nitrite-N Concentrations in Receiving Water Sites: 2008-2014



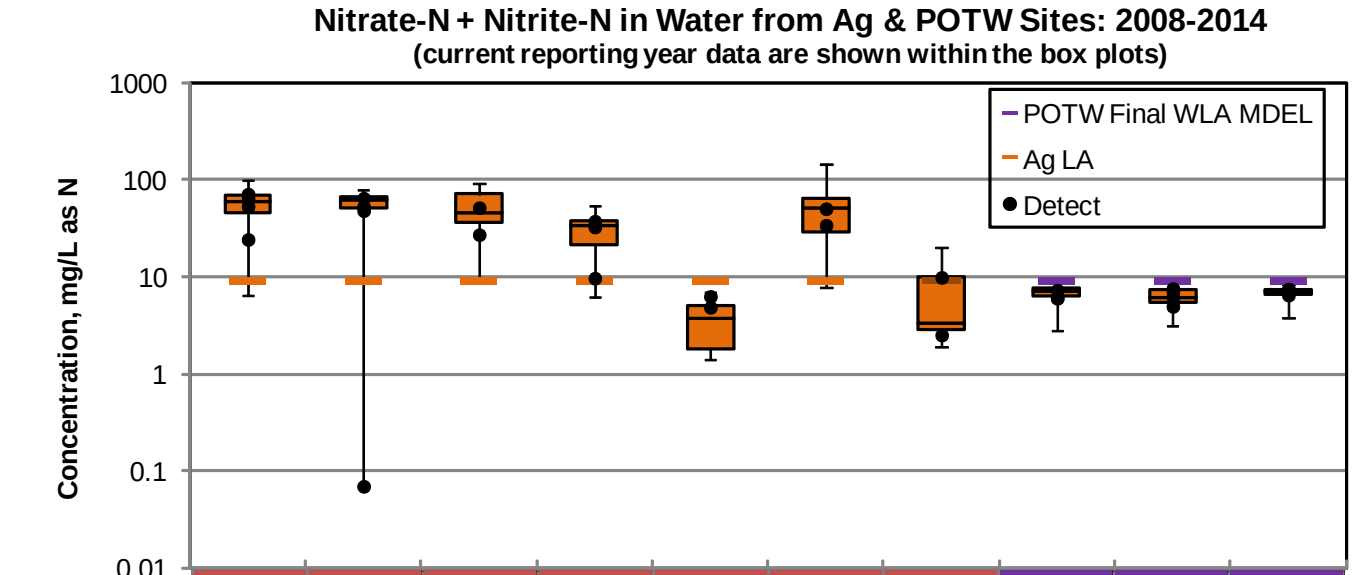
Date	Type	Event	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	39	0.2			0.11				0.014	<0.01	<0.1
Nov-13	Dry	40	0.05	0.08	3.87	*0.03*	*0.02*			0.013	<0.01	<0.1
Feb-14	Dry	41	0.08	0.07		0.05				0.019	0.1	<0.1
Feb-14	Storm	42	0.16	0.07	0.26	0.13	0.24	1.24	0.13			
May-14	Dry	43	0.61	0.15		0.15		1.19	0.27		0.1	<0.1

Figure 58. Nitrite-N Concentrations in Ag and POTW Sites: 2008-2014



Date	Type	Event	01_RR_BR	02_PCH	03_UNIV	04_WOOD	05_CENTR	06_SOMIS	07_HITCH	07_MADER	09A_HOWAR	09B_ADOLF	10_GATE	12_PARK	13_BELT
Aug-13	Dry	39	0.22	**14.5**	5.06	**39.2**	**34.9**	**12.4**	7.45	4.45	4.90	4.56	5.20	*0.04*	0.46
Nov-13	Dry	40	0.50	**14.4**	5.85	**36.4**	**28.2**	**10.3**	7.41	4.58	6.58	4.52	4.63	0.56	0.99
Feb-14	Dry	41	**21.3**	**19.5**	7.20	**33.3**	**29.0**	**10.2**	9.26	4.42	8.52	5.24	4.77	0.39	0.62
Feb-14	Storm	42	6.67		3.05	**11.6**	**12.9**	3.6	1.31	0.92		1.37	1.52		
May-14	Dry	43	**28.4**	**25.3**	5.46	**40.7**	**34.7**		**11.1**	3.89	5.13	3.91	5.38	0.09	0.26

Figure 59. Nitrate-N + Nitrite-N Concentrations in Receiving Water Sites: 2008-2014

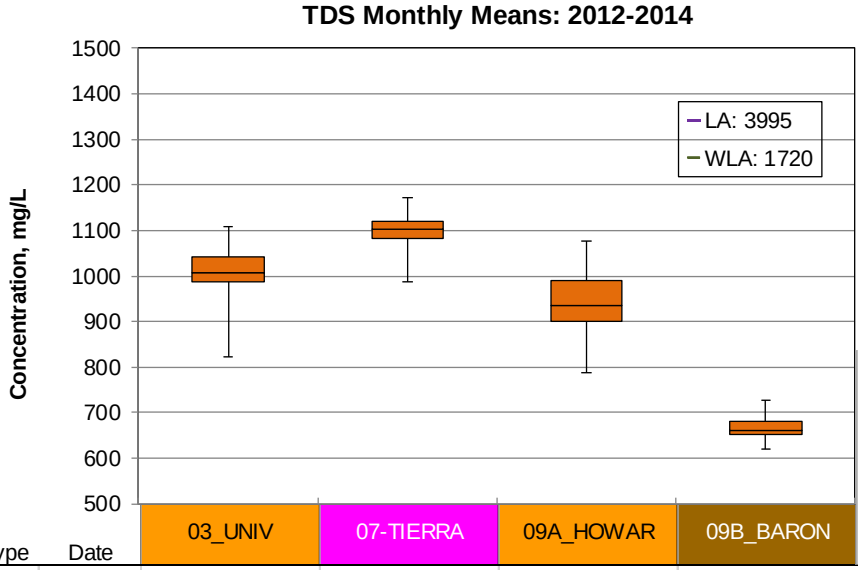


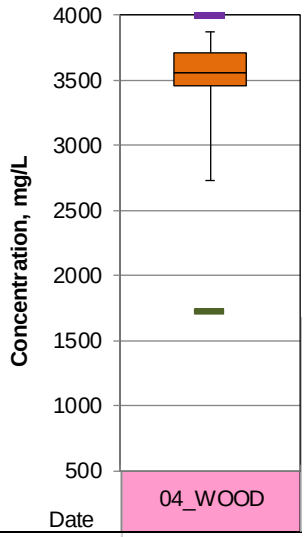
Date	Type	01T_ODD2_DCH	02D_BROOM	04D_WOOD	05D_SANT_VCWPD	06T_FC_BR	07D_HITCH_LEVEE_2	09BD_GERRY	07D_SIMI	09AD_CAMA	10D_HILL
Aug-13	Dry	**53.3**			**32.6**				7.3	5.0	7.5
Nov-13	Dry	**69**	**48.1**	**27.2**	**37.5**	4.9			6.1	6.3	6.5
Feb-14	Dry	**71.1**	**64.6**		**33.9**				6.0	7.6	7.5
Feb-14	Storm	**24**	0.07	**51.7**	**9.7**	6.3	**50.4**	2.5			
May-14	Dry	**63.3**	**52.9**		**33.8**		**34.0**	**9.9**		7.1	7.2

Figure 60. Nitrate-N + Nitrite-N Concentrations in Ag and POTW Sites: 2008-2014

SALTS TMDL

For the Salts TMDL, compliance with interim dry weather salt allocations is determined using monthly mean salt concentrations for dry weather developed from the time-series of data collected at receiving water sites. Bolded values in the tables within each figure indicate the concentration was above the interim MS4 WLA and the interim LA for that constituent. Italicized values in the tables within each figure indicate the concentration was above the interim MS4 WLA for that constituent.

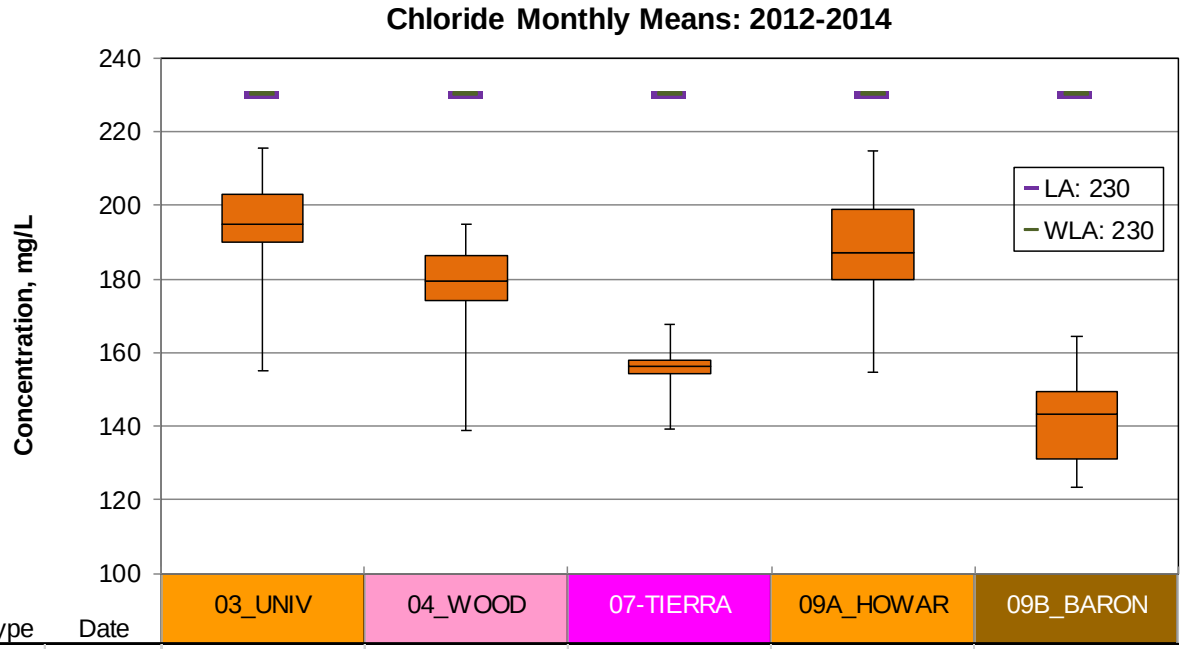




Type	Date	03_UNIV	07-TIERRA	09A_HOWAR	09B_BARON
Dry	Jul-12	1012			
Dry	Aug-12	991			656
Dry	Sep-12	978	1058	879	652
Dry	Oct-12	955	992	862	659
Dry	Nov-12	965	1042	875	661
Dry	Dec-12	821	988	787	621
Dry	Jan-13	924	1121	863	683
Dry	Feb-13	990	1080	918	688
Dry	Mar-13	1005	1111	922	674
Dry	Apr-13	994	1109	912	668
Dry	May-13	1110	1096	1077	657
Dry	Jun-13	1086	1122	1040	651
Dry	Jul-13	1021	1090	942	651
Dry	Aug-13	1059	1091	1009	651
Dry	Sep-13	1085	1082	1034	643
Dry	Oct-13	1060	1094	1000	657
Dry	Nov-13	1038	1101	977	653
Dry	Dec-13	1049	1112	992	664
Dry	Jan-14	1030	1107	980	669
Dry	Feb-14	1001	1106	934	679
Dry	Mar-14	962	1171	897	728
Dry	Apr-14	996	1173	928	726
Dry	May-14	1007	1170	936	707
Dry	Jun-14	1007	1154	934	699

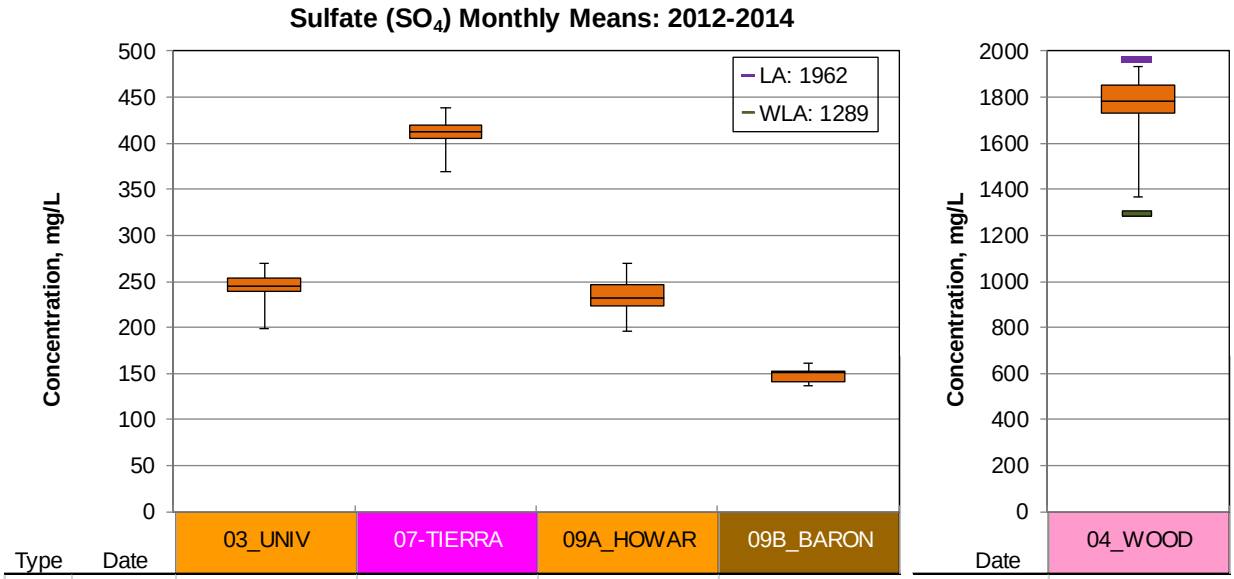
Date	04_WOOD
Jul-12	*3704*
Aug-12	*3707*
Sep-12	*3591*
Oct-12	*2730*
Nov-12	*3483*
Dec-12	*3747*
Jan-13	*3591*
Feb-13	*3722*
Mar-13	*3393*
Apr-13	*3505*
May-13	*3506*
Jun-13	*3873*
Jul-13	*3689*
Aug-13	*3713*
Sep-13	*3858*
Oct-13	*2940*
Nov-13	*3368*
Dec-13	*3392*
Jan-14	*3365*
Feb-14	*3525*
Mar-14	*3628*
Apr-14	*3525*
May-14	*3488*
Jun-14	*3767*

Figure 61. TDS Monthly Means for Receiving Water Sites Collected During Dry Weather



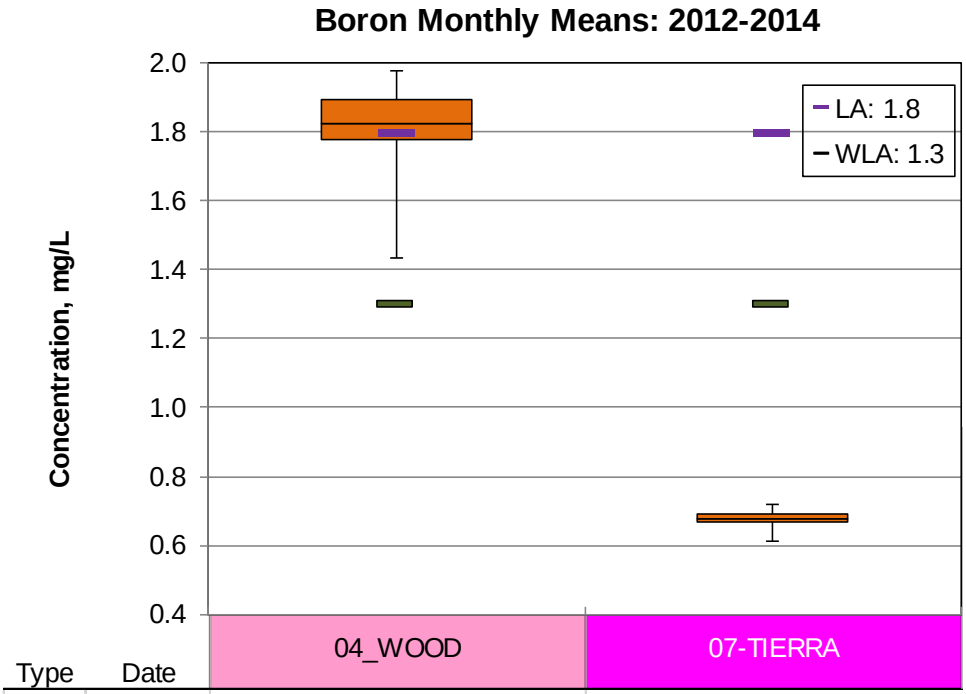
Type	Date	03_UNIV	04_WOOD	07-TIERRA	09A_HOWAR	09B_BARON
Dry	Jul-12	195	185			
Dry	Aug-12	191	186			130
Dry	Sep-12	188	180	149	174	129
Dry	Oct-12	183	139	140	170	131
Dry	Nov-12	185	175	147	173	131
Dry	Dec-12	155	187	139	155	123
Dry	Jan-13	177	180	158	171	136
Dry	Feb-13	191	186	152	182	136
Dry	Mar-13	194	171	157	183	134
Dry	Apr-13	191	176	156	181	133
Dry	May-13	216	176	154	215	130
Dry	Jun-13	211	193	158	207	129
Dry	Jul-13	199	187	156	189	145
Dry	Aug-13	207	188	156	203	146
Dry	Sep-13	213	195	154	209	143
Dry	Oct-13	207	151	156	201	147
Dry	Nov-13	202	171	157	196	146
Dry	Dec-13	205	173	159	200	149
Dry	Jan-14	201	171	158	197	150
Dry	Feb-14	195	179	158	187	152
Dry	Mar-14	186	184	167	179	165
Dry	Apr-14	194	179	168	186	164
Dry	May-14	196	177	167	188	159
Dry	Jun-14	196	191	165	187	157

Figure 62. Chloride Monthly Means for Receiving Water Sites Collected During Dry Weather



Type	Date	03_UNIV	07-TIERRA	09A_HOWAR	09B_BARON	Date	04_WOOD
Dry	Jul-12	246				Jul-12	*1850*
Dry	Aug-12	241			152	Aug-12	*1851*
Dry	Sep-12	238	395	219	151	Sep-12	*1793*
Dry	Oct-12	232	370	215	153	Oct-12	*1365*
Dry	Nov-12	235	389	218	154	Nov-12	*1740*
Dry	Dec-12	199	368	196	143	Dec-12	*1871*
Dry	Jan-13	224	420	215	159	Jan-13	*1793*
Dry	Feb-13	241	404	229	161	Feb-13	*1859*
Dry	Mar-13	244	416	230	157	Mar-13	*1695*
Dry	Apr-13	242	415	228	155	Apr-13	*1750*
Dry	May-13	270	410	270	152	May-13	*1751*
Dry	Jun-13	264	420	261	151	Jun-13	*1934*
Dry	Jul-13	248	407	234	138	Jul-13	*1850*
Dry	Aug-13	257	407	251	138	Aug-13	*1862*
Dry	Sep-13	264	404	258	136	Sep-13	*1935*
Dry	Oct-13	258	409	249	139	Oct-13	*1475*
Dry	Nov-13	252	411	243	138	Nov-13	*1690*
Dry	Dec-13	255	416	247	140	Dec-13	*1702*
Dry	Jan-14	251	414	244	141	Jan-14	*1688*
Dry	Feb-14	243	413	232	144	Feb-14	*1768*
Dry	Mar-14	234	438	223	153	Mar-14	*1820*
Dry	Apr-14	242	439	231	153	Apr-14	*1768*
Dry	May-14	245	438	233	149	May-14	*1750*
Dry	Jun-14	245	432	232	148	Jun-14	*1889*

Figure 63. Sulfate Monthly Means for Receiving Water Sites Collected During Dry Weather



Type	Date	04_WOOD	07-TIERRA
Dry	Jul-12	**1.89**	
Dry	Aug-12	**1.89**	
Dry	Sep-12	**1.83**	0.65
Dry	Oct-12	*1.43*	0.61
Dry	Nov-12	*1.78*	0.65
Dry	Dec-12	**1.91**	0.61
Dry	Jan-13	**1.83**	0.69
Dry	Feb-13	**1.90**	0.67
Dry	Mar-13	*1.74*	0.69
Dry	Apr-13	*1.79*	0.69
Dry	May-13	*1.79*	0.68
Dry	Jun-13	**1.97**	0.69
Dry	Jul-13	**1.89**	0.67
Dry	Aug-13	**1.91**	0.67
Dry	Sep-13	**1.98**	0.66
Dry	Oct-13	*1.52*	0.67
Dry	Nov-13	*1.74*	0.68
Dry	Dec-13	*1.75*	0.68
Dry	Jan-14	*1.73*	0.68
Dry	Feb-14	**1.81**	0.68
Dry	Mar-14	**1.86**	0.72
Dry	Apr-14	**1.81**	0.72
Dry	May-14	*1.79*	0.72
Dry	Jun-14	**1.93**	0.71

Figure 64. Boron Monthly Means for Receiving Water Sites Collected During Dry Weather

TISSUE DATA

Tissue data is provided in the following tables for both Mugu Lagoon and freshwater monitoring locations. These types of samples are only collected in Mugu Lagoon every three years; therefore data from years one and four are reported. For all tables, only those constituents that have been detected in at least one sample have been included.

Mugu Lagoon Tissue Data

Table 9. Mugu Lagoon – Central Lagoon Tissue Data [1]

Constituent	Units	8/21/2008 Composite Mussel Sample	8/21/2008 Whole Fish Composite Sample Top Smelt (*Atherinops affinis*)	8/18/2011 Composite Mussel Sample
Lipids in Mussel/Fish Tissue				
Percent Lipids	%	0.95	4.13	1.72
Organic Constituents in Mussel/Fish Tissue				
OC Pesticides				
2,4'-DDD	ng/g ww	7.5	ND	DNQ
2,4'-DDT	ng/g ww	ND	11.7	9.4
4,4'-DDD	ng/g ww	13.4	20.9	ND
4,4'-DDE	ng/g ww	125	406	118
4,4'-DDT	ng/g ww	ND	41.7	ND
Toxaphene	ng/g ww	94.4	294	DNQ
PCBs				
All Aroclors	ng/g ww	ND	ND	ND
Metals & Selenium in Mussel/Fish Tissue				
Total Mercury	µg/g ww	ND	0.02	0.0039
Total Selenium	µg/g ww	0.43	0.57	0.83

1. Only constituents with detected values are included in the table.

Table 10. Mugu Lagoon – Western Arm Tissue Data [1]

Constituent	Units	8/19/2008 Composite Mussel Sample	8/19/2008 Composite Bait Fish Sample Top Smelt (*Atherinops affinis*)	8/19/2008 Flat Fish Fillet Sample Diamond Turbot (*Hypsopsetta guttulata*)	8/19/2008 Whole Perch Fish Sample Shiner Surfperch (*Cymatogaster aggregate*)	8/18/2011 Composite Mussel Sample
Lipids in Mussel/Fish Tissue						
Percent Lipids	%	1.24	1.96	0.44	2.77	1.01
Organic Constituents in Mussel/Fish Tissue						
OC Pesticides						
Chlordane-alpha	ng/g ww	ND	ND	ND	12.7	ND
Chlordane-gamma	ng/g ww	ND	ND	ND	DNQ	ND
2,4'-DDD	ng/g ww	ND	ND	ND	9.2	DNQ
2,4'-DDE	ng/g ww	ND	ND	ND	ND	DNQ
2,4'-DDT	ng/g ww	ND	ND	ND	ND	DNQ
4,4'-DDD	ng/g ww	6.6	26.8	ND	139	ND
4,4'-DDE	ng/g ww	44	147	51	664	105
4,4'-DDT	ng/g ww	ND	ND	ND	79.4	ND
Toxaphene	ng/g ww	ND	ND	ND	117	ND
PCBs						
Aroclor 1254	ng/g ww	ND	ND	ND	55	ND
Metals & Selenium in Mussel/Fish Tissue						
Total Mercury	µg/g ww	DNQ	DNQ	DNQ	DNQ	0.012
Total Selenium	µg/g ww	0.37	0.51	0.92	0.52	0.48

1. Only constituents with detected values are included in the table.

Freshwater Tissue Data

Table 11. Calleguas Creek – University Drive CSUCI (03_UNIV) Fish Tissue Data Years 1-6 [1]

Date	Fish		Lipids	OC Pesticides [2]								PCBs [2]
			Percent Lipids	Chlordane -alpha	Chlordane -gamma	2,4'-DDD	2,4'-DDE	2,4'-DDT	4,4'-DDD	4,4'-DDE	4,4'-DDT	Toxaphene	Aroclor 1254
			%	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
8/6/08	Arroyo Chub	Whole Fish	4.7	DNQ	ND	ND	6.6	ND	ND	373	ND	ND	ND
9/3/09		Comp. #1	4.2	25	11	24	38	97	127	2422	13	6397	54
9/3/09		Comp. #2	5.7	20	13	28	38	102	116	2782	20	5675	55
9/3/09		Comp. #3	6.0	32	15	31	45	117	175	2951	18	4300	56
9/3/09	Black Bullhead	Carcass	2.5	43	22	22	13	ND	184	6980	469	6469	55
9/3/09		Fillet w/ Skin	1.3	29	13	12	ND	ND	90	3603	233	3283	32
9/3/09	Common Carp	Carcass #1	4.0	32	15	25	17	29	100	2209	240	4805	ND
9/3/09		Carcass #2	4.3	37	19	24	DNQ	16	112	2492	328	8510	21
9/3/09		Carcass #3	4.7	47	25	26	22	31	119	2744	466	ND	ND
9/3/09		Fillet w/ Skin #1	1.5	5.5	ND	DNQ	ND	10	21	413	46	ND	ND
9/3/09		Fillet w/ Skin #2	1.6	12	DNQ	13	ND	21	25	708	115	ND	ND
9/3/09		Fillet w/ Skin #3	1.9	7.5	DNQ	18	ND	33	45	772	140	ND	ND
9/3/10	Arroyo Chub	0-85 mm	4.3	DNQ	DNQ	ND	DNQ	DNQ	DNQ	167	16	ND	ND
9/3/10		86-112 mm	7.0	DNQ	DNQ	DNQ	12	30	44	1300	20	646	ND
9/3/10	Common Carp		4.3	DNQ	DNQ	DNQ	ND	DNQ	21	247	32	403	ND
8/25/11	Common Carp		1.9	DNQ	ND	DNQ	ND	8.5	ND	125	ND	DNQ	ND
8/30/12			1.5	ND	ND	ND	ND	ND	ND	175	ND	ND	ND
8/27/13	Whole Fish Composite Fathead Minnow Green Sunfish Common Carp		3.02	ND	ND	ND	ND	ND	ND	200.5	ND	ND	ND

1. Only constituents with detected values are included in the table.
2. Units are wet weight.

Table 12. Conejo Creek – Adolfo Road (9B_ADOLF) Fish Tissue Data Years 1 – 6 [1, 2]

Date	Fish		Lipids	OC Pesticides [3]								PCBs [3]
			Percent Lipids	Chlordane -alpha	Chlordane -gamma	2,4'-DDD	2,4'-DDE	2,4'-DDT	4,4'-DDD	4,4'-DDE	4,4'-DDT	Toxaphene	Aroclor 1254
			%	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
8/6/08	Common Carp		3.5	ND	ND	ND	ND	ND	ND	111	54	ND	ND
9/3/09	Arroyo chub	Comp. #1	8.6	19	8.2	10	22	54	47	694	14	3611	ND
9/3/09		Comp. #2	9.5	18	5.2	15	15	40	37	646	21	3213	56
9/3/09		Comp. #3	8.4	18	6.8	16	21	43	61	629	ND	2766	67
9/3/09	Common Carp	Carcass #1	2.5	21	6.0	15	ND	ND	27	754	ND	ND	54
9/3/09		Fillet w/ Skin #1	0.8	ND	ND	ND	ND	ND	10	190	ND	ND	ND
9/3/09		Carcass #2	4.8	49	24	18	ND	ND	170	3643	99	3566	93
9/3/09		Fillet w/ Skin #2	1.6	10	5.4	8.6	ND	ND	43	1019	30	ND	26
9/3/09		Carcass Comp. #3	4.0	27	15	19	12	131	58	1019	190	2544	70
9/3/09		Fillet Comp. w/ Skin #3	1.8	DNQ	ND	25	ND	57	37	274	86	ND	ND
9/3/10	Arroyo chub	0-85 mm	4.9	DNQ	ND	DNQ	DNQ	11	21	626	17	487	ND
9/3/10		86-112 mm	6.6	DNQ	DNQ	ND	DNQ	DNQ	DNQ	137	14	ND	ND
8/25/11	Common carp		2.4	DNQ	DNQ	ND	ND	DNQ	ND	49	ND	DNQ	ND
8/27/13	Largemouth Bass		1.28	ND	ND	ND	ND	ND	ND	85.7	ND	ND	ND

1. Only constituents with detected values are included in the table.
2. No fish were caught at this site during year five.
3. Units are wet weight.

Table 13. Arroyo Simi – Hitch Boulevard (07_HITCH) Fish Tissue Data Years 1 – 6 [1, 2]

Date	Fish			Lipids	OC Pesticides [3]								PCBs [3]
				Percent Lipids	Chlordane -alpha	Chlordane -gamma	2,4'-DDD	2,4'-DDE	2,4'-DDT	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aroclor 1254
				%	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
8/6/08	Arroyo Chub	Composite		8.3	ND	ND	ND	DNQ	ND	ND	521	ND	ND
9/3/09	Arroyo Chub	Composite #1	43-60mm	9.5	DNQ	ND	20	ND	52	233	955	ND	ND
9/3/09		Composite #1	65-90mm	10.6	ND	ND	5.3	DNQ	12	15.8	365	ND	ND
9/3/09		Composite #2	43-60mm	9.7	DNQ	ND	33	ND	749	437	1183	ND	ND
9/3/09		Composite #2	65-90mm	10.5	DNQ	ND	32	14.6	74	195	1648	26	28
9/3/09		Composite #3	43-60mm	8.3	DNQ	ND	26	ND	45	343	967	ND	ND
9/3/09		Composite #3	65-90mm	11.3	6.6	ND	27	ND	57	110	1275	38	ND
9/3/10		Arroyo Chub		7.8	ND	ND	DNQ	DNQ	19	19.2	673	DNQ	ND
8/28/13	Whole Fish Composite Largemouth Bass Goldfish			11.98	ND	ND	ND	ND	ND	ND	ND	ND	ND

1. Only constituents with detected values are included in the table.
2. No fish were caught at this site during years 4 or 5.
3. Units are wet weight.

Table 14. Arroyo Las Posas – Somis Road (06_SOMIS) Fish Tissue Data Years 1 – 6 [1, 2]

Date	Fish			Lipids	OC Pesticides [3]								PCBs [3]
				Percent Lipids	Chlordane -alpha	Chlordane -gamma	2,4'-DDD	2,4'-DDE	2,4'-DDT	4,4'-DDD	4,4'-DDE	Toxaphene	Aroclor 1254
				%	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
8/6/08	Arroyo Chub	Composite		2.7	ND	ND	ND	ND	ND	ND	492	ND	ND
9/3/09	Arroyo Chub	Composite #1	29-51mm	6.7	11	DNQ	37	ND	ND	646	1918	ND	34
9/3/09		Composite #1	53-97mm	4.6	DNQ	ND	62	ND	ND	535	1967	2821	36
9/3/09		Composite #2	29-51mm	6.8	9.0	DNQ	55	ND	ND	1158	2203	ND	31
9/3/09		Composite #2	53-97mm	6.2	12	5.9	28	16	43	128	2313	3054	44
9/3/09		Composite #3	29-51mm	5.7	10	DNQ	30	11	122	157	2124	ND	56
9/3/09		Composite #3	53-97mm	5.3	10	DNQ	12	ND	36	258	2258	2103	32

1. Only constituents with detected values are included in the table.
2. No fish were caught at this site during years 3, 4, 5, or 6.
3. Units are wet weight.

Table 15. Revolon Slough – Wood Road (04_WOOD) Fish Tissue Data Years 1 – 6 [1, 2]

Date	Fish		Lipids	OC Pesticides [3]								PCBs [3]
			Percent Lipids	Chlordane -alpha	Chlordane -gamma	2,4'-DDD	2,4'-DDE	2,4'-DDT	4,4'-DDD	4,4'-DDE	4,4'-DDT	Toxaphene	Aroclor 1254
			%	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
8/7/08	Common Carp	Comp. Fillet, no skin	3.0	ND	ND	27	ND	14	85	1194	21	349	ND
8/7/08		Comp. Fillet w/ skin	2.1	5.3	ND	18	7.4	DNQ	40	615	13	259	ND
9/3/09	Common Carp	Carcass	12.1	91	62	129	25	ND	1210	11100	904	25800	28
9/3/09		Fillet w/ Skin #1	2.8	35	21	55	17	ND	262	4210	328	6630	ND
9/3/09		Carcass	9.6	102	60	205	76	ND	1070	9590	367	17000	51
9/3/09		Fillet w/ Skin #2	3.3	47	31	110	31	ND	371	4790	168	5930	DNQ
9/3/09		Carcass	9.0	117	66	185	64	ND	1100	7750	411	14300	54
9/3/09		Fillet w/ Skin #3	2.7	54	33	77	39	50	378	4000	239	5480	20
9/3/09	Arroyo Chub	Comp. #1	8.7	41	27	133	77	191	878	6320	57	14700	24
9/3/09		Comp. #1	9.0	38	24	82	73	222	689	5630	36	19900	DNQ
9/3/09		Comp. #2	6.9	33	16	88	65	168	568	5580	52	17900	ND
8/25/11	Common carp		2.6	9.3	5.5	15	DNQ	67	ND	819	8.5	206	ND
9/4/12	Common carp		5.6	ND	ND	ND	ND	116	ND	1750	ND	ND	ND
8/27/13	Whole Fish Composite Common carp Fathead Minnow		6.3	ND	ND	ND	ND	ND	84.3	1984.1	ND	1611.1	ND

1. Only constituents with detected values are included in the table.
2. No fish were caught at this site during years 3.
3. Units are wet weight.

Table 16. Revolon Slough – Wood Road (04_WOOD) Metals Fish Tissue Data Years 1 – 6 [1, 2]

Date	Fish		Lipids	Metals [3]	
			Percent Lipids	Total Mercury	Total Selenium
			%	ng/g	ng/g
8/7/08	Common Carp	Comp. Fillet, no skin	3.0	DNQ	1.34
8/7/08		Comp. Fillet w/ skin	2.1	DNQ	2.29
9/3/09	Common Carp	Carcass #1	12.1	DNQ	1.49
9/3/09		Fillet w/ Skin #1	2.8	DNQ	1.64
9/3/09		Carcass #2	9.6	DNQ	1.97
9/3/09		Fillet w/ Skin #2	3.3	DNQ	2.1
9/3/09		Carcass #3	9.0	DNQ	1.37
9/3/09		Fillet w/ Skin #3	2.7	0.02	1.74
9/3/09	Arroyo Chub	Comp. #1	8.7	0.02	1.56
9/3/09		Comp. #1	9.0	0.02	1.77
9/3/09		Comp. #2	6.9	0.02	1.42
8/25/11	Common carp		2.6	0.0036	2.69
9/4/12	Common carp		5.6	0.011	1.89
8/27/13	Whole Fish Composite Common carp Fathead Minnow		6.3	0.013	1.95

1. Only constituents with detected values are included in the table.
2. No fish were caught at this site during year 3.
3. Units are wet weight.

TOXICITY DATA

The following is a summary of the toxicity results to date for water column and sediment at the freshwater sampling sites. Table 17 displays significant water column mortality test results for six years of CCWTMP events, including both dry and storm (bolded text) events. Significant mortality found in freshwater sediments is shown in Table 18.

Toxicity was frequently identified at the 04_WOOD site during the first two monitoring years in water column samples and in each of the four sediment samples. The stakeholders have chosen to invest resources into source control efforts to address sources potentially contributing to the toxicity issue. This is being accomplished through the implementation of the Agricultural Water Quality Management Plan (AWQMP) developed by the Ventura County Agricultural Irrigated Lands Group (VCAILG) as part of the Conditional Waiver for Irrigated Agricultural Lands (Ag Waiver).

During dry weather water column sampling, toxicity has been identified historically at all sampled sites except 13_BELT. There was one occurrence of dry weather water column toxicity during the sixth year of monitoring. Toxicity has been identified during wet weather monitoring at all sites, except for 10_GATE and 13_BELT. However, no wet weather toxicity occurred during the storm event for sixth year monitoring (Event 42).

Water column TIEs have been initiated as described previously, and outcomes of these efforts have had limited success in identifying the true cause of toxicity. While not identifying the specific constituents causing toxicity, the TIEs have identified:

- Organic compounds are likely contributors to ambient water toxicity.
- Compounds similar to organophosphorus (OP) pesticides are continually being identified as possible contributors to the observed toxicity.

The results of future CCWTMP toxicity testing will continue to assist in the identification of when and where conditions are toxic in the Calleguas Creek watershed, and help the stakeholders better target areas in the watershed that show continual toxicity and focus limited resources to address the problems. It is important to note that instances of observed mortality in water samples have generally been decreasing since the beginning of the CCWTMP. There were nine instances of significant mortality in water column samples during the first year of monitoring, with eight occurrences in the second year, three in the third year, five in the fourth year, two in the fifth year, and one in the sixth year.

Table 17. Water Column Toxicity for All Monitoring Events and Sites
(Significant mortality denoted by "X", bolded events are wet weather events)

CCWMTP Year	Events	Site ID						
		04_WOOD	9B_ADOLF	03_UNIV	10_GATE	06_SOMIS	13_BELT	07_HITCH
Year 1	1	X						
	2	X						
	3	**X**	**X**	**X**				**X**
	4	X						
	5	**X**						**X**
	6							
Year 2	9							
	12	X						
	14	**X**		**X**		**X**		
	16	**X**		**X**				**X**
	17							
	20			X				
Year 3	22							
	23							
	24	**X**						
	25							
	26	**X**						**X**
	27							
Year 4	28					X		
	29		X		X			
	30	**X**						
	31							
	32			**X**				
	33							
Year 5 [1]	34							
	35							
	36	**X** [2]						
	37			X [3]				
	38							
Year 6	39	X [2]						
	40				[4]			
	41		[6]	[6]	[6]	[6]	[5]	[6]
	42							
	43							

1. 10_GATE and 13_BELT are also toxicity investigation monitoring sites. During year 5 these sites were only sampled during event 38.
2. A TIE was not initiated at this site. TIEs conducted during previous monitoring years identified organic compounds such as pesticides as the likely cause of the toxicity. TIEs have been suspended while efforts are taken to reduce the source of the toxicity.
3. A Phase I TIE was conducted for this site. While the TIE did not conclusively identify a source of toxicity, the results were indicative of organic compounds. The corresponding water quality sample detected the OP pesticide chlorpyrifos at a concentration of 0.083 µg/L. This level is above the wasteload allocation for stormwater discharges but below the agricultural discharger's interim load allocation and above the final numeric target.
4. Toxicity testing was not performed at the 10_GATE site for Event 40.
5. Toxicity testing was not performed at the 10_BELT site for Event 41.
6. Successful toxicity testing for sites with conductivity less than 3000 µS/cm could not be completed for Event 41 due to a decline in the *C. dubia* laboratory culture. Sites include: 9B_ADOLF, 03_UNIV, 10_GATE, 06_SOMIS, and 07_HITCH.

Table 18. Sediment Toxicity for All CCWTMP Freshwater Monitoring Events and Sites
(Significant mortality denoted by "X")

CCWMTP Year	Events	Site ID			
		04_WOOD	02_PCH [1]	03_UNIV	9A_HOWAR [1]
Year 1	1	X			
Year 2	9	X			
Year 3	22	X			
Year 4	28	X	X	X	
Year 5	34	X	NS	X	NS
Year 6	39	X	NS	X [2]	NS

NS – Not Sampled; sites were not sampled during the corresponding monitoring year.
1. 02_PCH and 9A_HOWAR are toxicity investigation monitoring sites.
2. A TIE targeted for organics was performed for the 03_UNIV site due to a greater than 50 percent reduction in *H. azteca* survival.

As per the third year annual monitoring report recommendation, toxicity investigation monitoring was ceased during year five. Therefore, sediment toxicity sampling at 02_PCH and 9A_HOWAR did not take place during the two most recent monitoring years. Water column toxicity sampling did not take place at 10_GATE for Event 40 or 13_BELT for Event 41. There was significant toxicity at the 04_WOOD site and the 03_UNIV site during Event 39 sediment sampling. A TIE was not performed for the 04_WOOD site as there was less than a 50 percent reduction in survival relative to the control. However, sediment porewater and bulk sediment TIEs targeted for organics were performed for the 03_UNIV site. The results of the sediment porewater TIE suggest there are multiple compounds (organics and/or ammonia) contributing to sediment porewater toxicity. The results of the bulk sediment TIE suggest there are multiple compounds contributing to bulk sediment toxicity including non-polar organics and to a lesser extent, metals. However, the bulk sediment TIE results suggest that ammonia is not a cause of bulk sediment toxicity. This may also suggest that ammonia is not a cause of sediment porewater toxicity as the pH of porewater increases as it is removed from the sediment, which increases toxicity (i.e., the increase in pH accounts for the toxicity rather than the ammonia concentration).

Compliance Analysis and Discussion

COMPLIANCE COMPARISON

As outlined in the QAPP, data applicable to compliance targets or allocations is reviewed in this report. The following tables list the applicable compliance measures that are covered by the sixth year of monitoring. For the compliance assessment, two types of assessment procedures were used depending on whether or not the final compliance dates for the TMDL were applicable during the monitoring year.

For TMDLs for which no final allocations or targets are currently effective (OC Pesticides, Metals, and Salts TMDLs), the following compliance comparisons were conducted:

1. Applicable receiving water data at the compliance locations (base of each subwatershed) were compared to the interim load and waste load allocations.

2. If an exceedance of an interim load and/or waste load allocation was observed, the contributing land use data were assessed to evaluate the potential cause of the exceedance.
3. POTW effluent data were compared to the relevant interim waste load allocations.

For the Nitrogen TMDL the following compliance comparisons were conducted:

1. For POTWs, the final waste load allocations are currently effective. As a result, effluent monitoring results were compared to the final allocations for the analysis.
2. For agricultural dischargers and other non-point sources, load allocations are currently effective. Since agricultural dischargers are the only entities with allocations other than POTWs, compliance is assessed by comparing receiving water results against TMDL numeric targets.

For the Toxicity TMDL, the following compliance comparisons were conducted:

1. For POTWs, the final waste load allocations are currently effective. As a result, effluent monitoring results were compared to the final allocations for the analysis.
2. For MS4 dischargers, the final waste load allocations are currently effective. As a result, applicable receiving water data at the compliance locations (base of each subwatershed) were compared to the final waste load allocations. If an exceedance of the final waste load allocation was found, the contributing urban land use data were assessed to evaluate whether the MS4 was potentially causing the exceedance.
3. For agricultural dischargers, the final load allocations are not yet effective. As a result, applicable receiving water data at the compliance locations (base of each subwatershed) were compared to the interim load allocations. If an exceedance of an interim load allocation was observed, the contributing agricultural land use data were assessed to evaluate whether agricultural discharges were potentially causing the exceedance.
4. In cases where the applicable interim load allocations or final waste load allocations have different values for acute (1-hour) toxicity and chronic (4-day) toxicity, the acute toxicity allocations were used for assessing wet weather data and the chronic toxicity allocations were used for assessing dry-weather data.

The following tables compare the applicable allocations based on the compliance procedure outlined above for each of the TMDLs. Some constituents sampled under the CCWTMP do not have applicable allocations and/or targets and are not included in the compliance analysis.

COMPLIANCE AT RECEIVING WATER SITES

Table 19. OC Pesticides, PCBs, & Siltation in Sediment

Site & Constituent	Units	Interim WLA & LA [1]	Event 39 Aug-2013
Calleguas Creek – Hwy 1 Bridge (02_PCH)			
Total Chlordane [2]	ng/g dw	17	ND
4,4'-DDD	ng/g dw	66	ND
4,4'-DDE	ng/g dw	470	7.5
4,4'-DDT	ng/g dw	110	ND
Dieldrin	ng/g dw	3	ND
PCBs [3]	ng/g dw	3800	ND
Toxaphene	ng/g dw	260	ND
Revolon Slough – Wood Road (04_WOOD)			
Total Chlordane [2]	ng/g dw	48	ND
4,4'-DDD	ng/g dw	400	ND
4,4'-DDE	ng/g dw	1600	39.9
4,4'-DDT	ng/g dw	690	DNQ
Dieldrin	ng/g dw	5.7	ND
PCBs [3]	ng/g dw	7600	ND
Toxaphene	ng/g dw	790	69.3
Calleguas Creek – University Drive CSUCI (03_UNIV)			
Total Chlordane [2]	ng/g dw	17	ND
4,4'-DDD	ng/g dw	66	ND
4,4'-DDE	ng/g dw	470	DNQ
4,4'-DDT	ng/g dw	110	ND
Dieldrin	ng/g dw	3	ND
PCBs [3]	ng/g dw	3800	ND
Toxaphene	ng/g dw	260	DNQ
Conejo Creek – Adolfo Road (9B_ADOLF)			
Total Chlordane [2]	ng/g dw	3.4	ND
4,4'-DDD	ng/g dw	5.3	ND
4,4'-DDE	ng/g dw	20	DNQ
4,4'-DDT	ng/g dw	2	ND
Dieldrin	ng/g dw	3	ND
PCBs [3]	ng/g dw	3800	ND
Toxaphene	ng/g dw	260	ND

Table 20. OC Pesticides, PCBs, & Siltation in Sediment (continued)

Site & Constituent	Units	Interim WLA & LA [1]	Event 39 Aug-2013
Arroyo Las Posas – Somis Road (06_SOMIS)			
Total Chlordane [2]	ng/g dw	3.3	ND
4,4'-DDD	ng/g dw	290	DNQ
4,4'-DDE	ng/g dw	950	10.4
4,4'-DDT	ng/g dw	670	ND
Dieldrin	ng/g dw	1.1	ND
PCBs [3]	ng/g dw	25,700	ND
Toxaphene	ng/g dw	230	ND
Arroyo Simi – Hitch Boulevard (07_HITCH)			
Total Chlordane [2]	ng/g dw	3.3	ND
4,4'-DDD	ng/g dw	14	ND
4,4'-DDE	ng/g dw	170	DNQ
4,4'-DDT	ng/g dw	25	ND
Dieldrin	ng/g dw	1.1	ND
PCBs [3]	ng/g dw	25,700	ND
Toxaphene	ng/g dw	230	ND

ND=not detected; DNQ=detected not quantifiable

1. Interim waste load allocation for stormwater permittees and interim load allocations for agricultural dischargers; effective until March 24, 2026 (R4-2005-010).
2. Total chlordane is the sum of alpha and gamma-chlordane.
3. PCBs concentrations are the sum of the seven aroclors identified in CTR (1016, 1221, 1232, 1242, 1248, 1254, and 1260).

Table 21. Nitrogen Compounds in Water

Site & Constituent	Units	Target [1]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 42 Wet Feb-2014	Event 43 Dry May-2014
Mugu Lagoon – Ronald Reagan Bridge (01_RR_BR)							
Ammonia-N	mg/L	8.1 [2]	0.35	DNQ	0.11	0.33	0.29
Nitrate-N	mg/L	10	0.21	0.5	**21.19**	6.6	**28.08**
Nitrite-N	mg/L	1	0.01	ND	0.06	0.07	0.3
Nitrate-N + Nitrite-N	mg/L	10	0.22	0.5	**21.25**	6.67	**28.38**
Revolon Slough – Wood Road (04_WOOD)							
Ammonia-N	mg/L	5.7 [2]	0.31	0.17	0.14	0.14	0.08
Nitrate-N	mg/L	10	**38.9**	**36.31**	**33.13**	**11.47**	**39.81**
Nitrite-N	mg/L	1	0.34	0.1	0.19	0.1	0.85
Nitrate-N + Nitrite-N	mg/L	10	**39.24**	**36.41**	**33.32**	**11.57**	**40.66**
Beardsley Wash – Central Avenue (05_CENTR)							
Ammonia-N	mg/L	5.7 [2]	DNQ	0.21	0.06	0.15	0.14
Nitrate-N	mg/L	10	**34.75**	**28.16**	**28.88**	**12.76**	**34.37**
Nitrite-N	mg/L	1	0.14	0.07	0.08	0.13	0.31
Nitrate-N + Nitrite-N	mg/L	10	**34.89**	**28.23**	**28.96**	**12.89**	**34.68**
Calleguas Creek – Hwy 1 Bridge (02_PCH)							
Ammonia-N	mg/L	5.5 [2]	0.18	0.1	0.17	NR	0.07
Nitrate-N	mg/L	10	**14.53**	**14.32**	**19.45**	NR	**25.34**
Nitrite-N	mg/L	1	ND	0.08	ND	NR	ND
Nitrate-N + Nitrite-N	mg/L	10	**14.53**	**14.4**	**19.45**	NR	**25.34**
Calleguas Creek – University Drive CSUCI (03_UNIV)							
Ammonia-N	mg/L	8.4 [2]	0.06	0.16	0.1	0.22	DNQ
Nitrate-N	mg/L	10	5.06	5.85	7.16	3.03	5.46
Nitrite-N	mg/L	1	ND	ND	0.04J	0.02J	ND
Nitrate-N + Nitrite-N	mg/L	10	5.06	5.85	7.2	3.05	5.46
Conejo Creek – Howard Road Bridge (9A_HOWAR)							
Ammonia-N	mg/L	9.5 [2]	0.76	0.59	0.93	NR	1.63
Nitrate-N	mg/L	10	4.83	6.58	8.52	NR	5.13
Nitrite-N	mg/L	1	0.07	ND	ND	NR	ND
Nitrate-N + Nitrite-N	mg/L	10	4.9	6.58	8.52	NR	5.13

Table 22. Nitrogen Compounds in Water (continued)

Site & Constituent	Units	Target [1]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 42 Wet Feb-2014	Event 43 Dry May-2014
Conejo Creek – Adolfo Road (9B_ADOLF)							
Ammonia-N	mg/L	9.5 [2]	DNQ	0.06	DNQ	0.29	ND
Nitrate-N	mg/L	10	4.56	4.52	5.24	1.35	3.91
Nitrite-N	mg/L	1	ND	ND	ND	0.02J	ND
Nitrate-N + Nitrite-N	mg/L	10	4.56	4.52	5.24	1.37	3.91
Conejo Creek – Hill Canyon Below N Fork (10_GATE)							
Ammonia-N	mg/L	8.4 [2]	0.52	0.43	0.28	0.17	0.28
Nitrate-N	mg/L	10	5.01	4.56	4.67	1.52	5.27
Nitrite-N	mg/L	1	0.19	0.07	0.1	ND	0.11
Nitrate-N + Nitrite-N	mg/L	10	5.2	4.63	4.77	1.52	5.38
Conejo Creek – North Fork Above Hill Canyon (12_PARK)							
Ammonia-N	mg/L	3.2 [2]	ND	0.05	DNQ	NR	DNQ
Nitrate-N	mg/L	10	0.04J	0.56	0.39	NR	0.09
Nitrite-N	mg/L	1	ND	ND	ND	NR	ND
Nitrate-N + Nitrite-N	mg/L	10	0.04J	0.56	0.39	NR	0.09
Conejo Creek – S Fork Behind Belt Press Build (13_BELT)							
Ammonia-N	mg/L	5.1 [2]	DNQ	0.07	ND	NR	ND
Nitrate-N	mg/L	10	0.46	0.99	0.62	NR	0.26
Nitrite-N	mg/L	1	ND	ND	ND	NR	ND
Nitrate-N + Nitrite-N	mg/L	10	0.46	0.99	0.62	NR	0.26
Arroyo Las Posas – Somis Road (06_SOMIS)							
Ammonia-N	mg/L	8.1 [2]	0.07	0.06	ND	0.39	NS
Nitrate-N	mg/L	10	**12.35**	**10.27**	**10.24**	3.57	NS
Nitrite-N	mg/L	1	ND	ND	ND	0.05	NS
Nitrate-N + Nitrite-N	mg/L	10	**12.35**	**10.27**	**10.24**	3.62	NS
Arroyo Simi – Hitch Boulevard (07_HITCH)							
Ammonia-N	mg/L	4.7 [2]	0.07	0.09	ND	0.46	ND
Nitrate-N	mg/L	10	7.4	7.41	9.23	1.29	**11.11**
Nitrite-N	mg/L	1	0.05	ND	0.03J	0.02J	ND
Nitrate-N + Nitrite-N	mg/L	10	7.45	7.41	9.26	1.31	**11.11**

Table 23. Nitrogen Compounds in Water (continued)

Site & Constituent	Units	Target [1]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 42 Wet Feb-2014	Event 43 Dry May-2014
Arroyo Simi – Madera Avenue (07_MADER)							
Ammonia-N	mg/L	4.7 [2]	0.05	DNQ	0.23	0.4	0.11
Nitrate-N	mg/L	10	4.34	4.58	4.38	0.89	3.82
Nitrite-N	mg/L	1	0.11	ND	0.04J	0.03J	0.07
Nitrate-N + Nitrite-N	mg/L	10	4.45	4.58	4.42	0.92	3.89

NS=no sample, dry; NR=not required; ND=not detected; DNQ=detected not quantifiable; J=estimated DNQ values for Nitrite-N, shown for the purpose of calculating the Nitrite-N + Nitrate-N sum and comparing it against the Nitrate-N + Nitrite-N target.

1. Load allocations for Nitrate-N + Nitrite-N are in effect for agricultural and other non-point sources. To evaluate compliance, monitoring results at receiving water compliance sites were compared against TMDL numeric targets (R4-2008-009).
2. One-hour average.

Results in **bold red type** exceed numeric TMDL target.

Table 24. Toxicity, Diazinon, and Chlorpyrifos in Water

Site & Constituent	Units	Dry WLA [1]	Dry Interim LA [2]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 43 Dry May-2014	Wet WLA [1]	Wet Interim LA [2]	Event 42 Wet Feb-2014
Mugu Lagoon – Ronald Reagan Bridge (01_RR_BR)										
Chlorpyrifos	µg/L	0.014	0.81	ND	ND	ND	ND	0.014	2.57	**0.0924**
Diazinon	µg/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	0.0095
Revolon Slough – Wood Road (04_WOOD)										
Chlorpyrifos	µg/L	0.014	0.81	ND	0.0026	0.0117	ND	0.014	2.57	**0.1691**
Diazinon	µg/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	0.0232
Calleguas Creek – University Drive CSUCI (03_UNIV)										
Chlorpyrifos	µg/L	0.014	0.81	ND	ND	0.0054	0.0046	0.014	2.57	0.0314
Diazinon	µg/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	0.0094
Conejo Creek – Adolfo Road (9B_ADOLF)										
Chlorpyrifos	µg/L	0.014	0.81	ND	ND	ND	ND	0.014	2.57	ND
Diazinon	µg/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	ND
Arroyo Las Posas – Somis Road (06_SOMIS)										
Chlorpyrifos	µg/L	0.014	0.81	ND	ND	0.0027	NS	0.014	2.57	**0.1325**
Diazinon	µg/L	0.1	0.138	ND	ND	ND	NS	0.1	0.278	ND
Arroyo Simi – Hitch Boulevard (07_HITCH)										
Chlorpyrifos	µg/L	0.014	0.81	ND	ND	0.008	0.0027	0.014	2.57	ND
Diazinon	µg/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	0.0158

ND=not detected; NS=no sample collected due to site being dry.

1. Final Dry and Wet Weather WLAs for Stormwater Dischargers effective as of March 24, 2008 (R4-2005-009).
2. Interim Dry and Wet Weather Load Allocations for Irrigated Agriculture; effective until March 24, 2016 (R4-2005-009).

Results in **bold purple type** exceed the final WLA, but not the interim LA.

Table 25. Metals and Selenium in Water

Constituent	Units	Dry Interim WLA [1]	Dry Interim LA [2]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 43 Dry May-2014	Wet Interim WLA [1]	Wet Interim LA [2]	Event 42 Wet Feb-2014	Annual Average [3]
Revolon Slough – Wood Road (04_WOOD)											
Total Copper	µg/L	19	19	4.68	3.80	5.69	2.78	204	1390	70.28	
Total Nickel	µg/L	13	42	6.7	8.09	6.93	7.21	74 [4]	74 [4]	47.32	
Total Selenium	µg/L	13	6	**17.72**	**17.77**	**20.98**	**20.98**	290 [4]	290 [4]	4.31	
Total Mercury [5]	lbs/yr	1.7	2					4	4.8		0.012
Calleguas Creek – University Drive CSUCI (03_UNIV)											
Total Copper	µg/L	19	19	2.28	2.2	2.78	2.55	204	1390	72.31	
Total Nickel	µg/L	13	42	6.40	5.33	5.46	5.97	74 [4]	74 [4]	59.79	
Total Selenium	µg/L	--	--	0.65	0.49	0.57	0.62	--	--	1.52	
Total Mercury [5]	lbs/yr	3.3	3.9					10.5	12.6		0.035

1. Interim Dry Weather WLAs for Stormwater Dischargers; effective until March 2022 (R4-2006-0012)
2. Interim Dry Weather LAs for Irrigated Agriculture; effective until March 2022 (R4-2006-0012)
3. Mercury allocation is assessed as an annual load in suspended sediment. The water column mercury concentrations were used in calculating the loads, conservatively assuming that all mercury is on suspended sediment rather than being dissolved. The loads at each site are based on estimated annual concentrations (average of all monitored events at each site) and total annual flow calculated from preliminary streamflow data received from real time data loggers.
4. No wet weather exceedances of these constituents were observed in the TMDL analysis so no interim limits were assigned for the TMDL. For comparison purposes the wet weather targets are included in the table.
5. Interim WLA and LAs are expressed as annual loads. Total annual flow for 07/01/12 to 06/31/13 into Mugu Lagoon from Calleguas Creek and Revolon Slough is calculated as 4,926 Mgal/yr. As such, the interim WLA and LA shown correspond to the flow range of 0 to 15,000 to Mgal/yr, per R4-2006-0012.

Results in **bold red type** exceed applicable interim WLA and LA.

Table 26. Monthly Mean Salts Concentrations

	Units	Interim Limit		Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14
		WLA	LA												
Revolon Slough – Wood Road (04_WOOD)															
Total Dissolved Solids	mg/L	1720	3995	**3689**	**3713**	**3858**	**2940**	**3368**	**3392**	**3365**	**3525**	**3628**	**3525**	**3488**	**3767**
Chloride	mg/L	230	230	187	188	195	151	171	173	171	179	184	179	177	191
Sulfate	mg/L	1289	1962	**1850**	**1862**	**1935**	**1475**	**1690**	**1702**	**1688**	**1768**	**1820**	**1768**	**1750**	**1889**
Boron	mg/L	1.3	1.8	**1.89**	**1.91**	**1.98**	**1.52**	**1.74**	**1.75**	**1.73**	**1.81**	**1.86**	**1.81**	**1.79**	**1.93**
Calleguas Creek – University Drive CSUCI (03_UNIV)															
Total Dissolved Solids	mg/L	1720	3995	1021	1059	1085	1060	1038	1049	1030	1001	962	996	1007	1007
Chloride	mg/L	230	230	199	207	213	207	202	205	201	195	186	194	196	196
Sulfate	mg/L	1289	1962	248	257	264	258	252	255	251	243	234	242	245	245
Conejo Creek – Howard Road Bridge (9A_HOWAR)															
Total Dissolved Solids	mg/L	1720	3995	942	1009	1034	1000	977	992	980	934	897	928	936	934
Chloride	mg/L	230	230	189	203	209	201	196	200	197	187	179	186	188	187
Sulfate	mg/L	1289	1962	234	251	258	249	243	247	244	232	223	231	233	232
Conejo Creek – Baron Brothers Nursery (9B_BARON)															
Total Dissolved Solids	mg/L	1720	3995	651	651	643	657	653	664	669	679	728	726	707	699
Chloride	mg/L	230	230	145	146	143	147	146	149	150	152	165	164	159	157
Sulfate	mg/L	1289	1962	138	138	136	139	138	140	141	144	153	153	149	148
Arroyo Simi – Tierra Rejada Road (07_TIERRA)															
Total Dissolved Solids	mg/L	1720	3995	1090	1091	1082	1094	1101	1112	1107	1106	1171	1173	1170	1154
Chloride	mg/L	230	230	156	156	154	156	157	159	158	158	167	168	167	165
Sulfate	mg/L	1289	1962	407	407	404	409	411	416	414	413	438	439	438	432
Boron	mg/L	1.3	1.8	0.67	0.67	0.66	0.67	0.68	0.68	0.68	0.68	0.72	0.72	0.72	0.71

Notes:

a. Monthly dry weather mean salt concentrations were generated using mean daily salt concentrations (from 5-min data) for days that met the definition of dry weather in the Salts TMDL (i.e., discharge < 86th percentile flow *and* no measureable rain in preceding 24 hrs). The 86th percentile of mean daily discharge at 03_Univ (generated using 5-min discharge data for the period July 1, 2012-June 30, 2013) was used as the flow-related threshold for distinguishing wet and dry days for all five compliance sites. Daily precipitation records for 23 gages in the CCW watershed (accessed via the VCWPD Hydrologic Data Server) were used to determine days with "measureable precipitation". Days were considered as having measureable precipitation if two or more rain gages in the watershed received 0.1 inch or more of precipitation.

Results in **bold red type** exceed both the applicable interim WLA and LA. Results in **bold purple type** exceed the interim WLA, but not the interim LA.

POTW COMPLIANCE

Table 27. Nitrogen Compounds – POTWs

POTW & Constituent	Units	Final WLA [1]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 43 Dry May-2014
Camarillo Water Reclamation Plant (9AD_CAMA)						
Ammonia-N	mg/L	3.5 [2], 7.8 [3]	1.03	1.35	1.29	1.26
Nitrate-N	mg/L	9	4.97	6.25	7.5	7.0
Nitrite-N	mg/L	0.9	ND	ND	0.1	0.1
Nitrate-N + Nitrite-N	mg/L	9	4.97	6.25	7.6	7.1
Hill Canyon Wastewater Treatment Plant (10D_HILL)						
Ammonia-N	mg/L	3.1 [2], 5.6 [3]	1.6	1.6	1.2	1.7
Nitrate-N	mg/L	9	7.5	6.5	7.5	7.2
Nitrite-N	mg/L	0.9	ND	ND	ND	ND
Nitrate-N + Nitrite-N	mg/L	9	7.5	6.5	7.5	7.2
Simi Valley Water Quality Control Plant (07D_SIMI)						
Ammonia-N	mg/L	2.4 [2], 3.3 [3]	1.2	1.2	1.5	1.0
Nitrate-N	mg/L	9	7.3	6.1	6.0	6.0
Nitrite-N	mg/L	0.9	0.014	0.013	0.019	0.06
Nitrate-N + Nitrite-N	mg/L	9	7.31	6.11	6.02	6.06

ND=constituent not detected at the MDL.

1. The effective date for these WLAs was July 16, 2007 (R4-2008-009)
2. WLAs as Average Monthly Effluent Limit
3. WLAs as Maximum Daily Effluent Limit

Table 28. OC Pesticides, PCBs, and Siltation - POTWs

POTW & Constituent	Units	Interim WLA [1]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 43 Dry May-2014
Camarillo Water Reclamation Plant (9AD_CAMA)						
Total Chlordane [2]	ng/L	100	ND	ND	ND	ND
4,4'-DDD	ng/L	6	ND	ND	ND	ND
4,4'-DDE	ng/L	188	ND	ND	ND	ND
4,4'-DDT	ng/L	10	ND	ND	ND	ND
Dieldrin	ng/L	10	ND	ND	ND	ND
PCBs [3]	ng/L	31	ND	ND	ND	ND
Toxaphene	ng/L	500	ND	ND	ND	ND
Hill Canyon Wastewater Treatment Plant (10D_HILL)						
Total Chlordane [2]	ng/L	1.2	ND	ND	ND	ND
4,4'-DDD	ng/L	20	ND	ND	ND	ND
4,4'-DDE	ng/L	260	ND	ND	ND	ND
4,4'-DDT	ng/L	10	ND	ND	ND	ND
Dieldrin	ng/L	10	ND	ND	ND	ND
PCBs [3]	ng/L	500	ND	ND	ND	ND
Toxaphene	ng/L	500	ND	ND	ND	ND
Simi Valley Water Quality Control Plant (07D_SIMI)						
Total Chlordane [2]	ng/L	100	ND	ND	ND	ND
4,4'-DDD	ng/L	50	ND	ND	ND	ND
4,4'-DDE	ng/L	1.2	ND	ND	ND	ND
4,4'-DDT	ng/L	10	ND	ND	ND	ND
Dieldrin	ng/L	10	ND	ND	ND	ND
PCBs [3]	ng/L	500	ND	ND	ND	ND
Toxaphene	ng/L	500	ND	ND	ND	ND

ND=constituent not detected at the MDL.

1. Interim daily WLAs are effective until March 14, 2026 (R4-2005-010).
2. Total chlordane is the sum of alpha and gamma-chlordane.
3. PCBs concentrations are the sum of the seven aroclors identified in CTR (1016, 1221, 1232, 1242, 1248, 1254, and 1260).

Table 29. Toxicity, Chlorpyrifos, and Diazinon - POTWs

POTW & Constituent	Units	Final WLA [1]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 43 Dry May-2014
Camarillo Water Reclamation Plant (9AD_CAMA)						
Chlorpyrifos	µg/L	0.0133	ND	ND	ND	ND
Diazinon	µg/L	0.1	ND	ND	ND	ND
Hill Canyon Wastewater Treatment Plant (10D_HILL)						
Chlorpyrifos	µg/L	0.014	ND	ND	ND	ND
Diazinon	µg/L	0.1	ND	ND	ND	ND
Simi Valley Water Quality Control Plant (07D_SIMI)						
Chlorpyrifos	µg/L	0.014	ND	ND	ND	ND
Diazinon	µg/L	0.1	ND	ND	ND	ND

ND=constituent not detected at MDL.

1. The effective date for these WLAs was March 16, 2008 (R4-2005-009).

Table 30. Metals and Selenium - POTWs

POTW & Constituent	Units	Daily Max WLA	Monthly Avg WLA	WLA	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 43 Dry May-2014
Camarillo Water Reclamation Plant (9AD_CAMA)								
Total Copper	µg/L	57.0 [1]	20.0 [1]	--	3.5	3.8	4.0	3.9
Total Nickel	µg/L	16.0 [1]	6.2 [1]	--	3.39	3.34	2.81	2.8
Total Mercury [3]	lbs/month [4]	--	--	0.03 [1]	0.0002	0.0001	0.0003	0.0001
Hill Canyon Wastewater Treatment Plant (10D_HILL)								
Total Copper	µg/L	20.0 [1]	16.0 [1]	--	6.3	4.8	4.0	2.9
Total Nickel	µg/L	8.3 [1]	6.4 [1]	--	2.2	2.1	3.5	2.0
Total Mercury [3]	lbs/month [4]	--	--	0.23 [1]	0.0044	0.0043	0.0041	0.0045
Simi Valley Water Quality Control Plant (07D_SIMI)								
Total Copper	µg/L	31.0 [2]	30.5 [2]	--	6.1	5.1	4.2	5.6
Total Nickel	µg/L	960 [2]	169 [2]	--	2.2	1.6	1.7	1.5
Total Mercury [3]	lbs/month [4]	--	--	0.18 [1]	0.0005	0.0032	0.0025	0.0042

1. Interim WLA; effective until March 26, 2017 (R4-2006-012)
2. Final WLA; effective date was March 26, 2007 (R4-2006-012)
3. For total mercury concentrations reported as not detected (ND); one half of the method detection limit was used to calculate the monthly loads
4. During load calculation, the average monthly flow for each POTW was multiplied by the number of days in the month corresponding to when the sample was collected to get a total monthly flow. The total monthly flow was multiplied by the concentration of total mercury to yield the monthly total mercury load in pounds.

Table 31. Salts - POTWs

POTW & Constituent	Units	Monthly Avg Interim WLA	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14
Camarillo Water Reclamation Plant (9AD_CAMA) [1]														
Boron	mg/L	N/A	0.6	0.53	0.53	0.55	0.53	0.53	0.48	0.64	0.5	0.55	0.58	0.48
Chloride	mg/L	216	**241**	**240**	**247**	**240**	**243**	**239**	**231**	**259**	**227**	**240**	**225**	**224**
Sulfate	mg/L	283	**351**	**326**	**292**	**348**	**326**	**295**	253	**320**	**330**	**327**	254	212
Total Dissolved Solids	mg/L	1012	**1170**	**1124**	1010	974	**1152**	**1080**	**1034**	**1036**	930	**1150**	**1084**	**1146**
Hill Canyon Wastewater Treatment Plant (10D_HILL)														
Boron	mg/L	N/A	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5
Chloride	mg/L	189	138	137	134	136	138	173	147	146	153	156	149	149
Sulfate	mg/L	N/A	80	86	87	88	85	82	84	85	99	130	123	116
Total Dissolved Solids	mg/L	N/A	530	543	535	540	546	555	519	546	578	627	616	610
Simi Valley Water Quality Control Plant (07D_SIMI)														
Boron	mg/L	N/A	0.45	0.5	0.51	0.46	0.49	0.47	0.46	0.45	0.47	0.46	0.46	0.46
Chloride	mg/L	183	149	149	144	132	129	138	136	131	137	135	136	136
Sulfate	mg/L	298	161	167	159	157	165	169	162	177	236	238	210	207
Total Dissolved Solids	mg/L	955	658	675	657	652	654	671	653	671	665	759	681	699

N/A: "The 95th percentile concentration is below the Basin Plan objective so interim limits are not necessary."

Results in **bold red type** exceed applicable interim WLA.

1. Due to water conservation and alterations in the composition of the water supply available in the POTW service area, effluent salt concentrations have increased since the adoption of the TMDL. The increased salts concentrations are being addressed through a Time Schedule Order that provides for higher TDS and sulfate interim limits and a stay of interim limits for chloride (SWRCB WQO 2003-0019).

COMPLIANCE COMPARISON DISCUSSION

OC Pesticides, Toxicity, Metals, Nutrients, and Salts

The compliance analysis shown in Table 19 through Table 31 above demonstrates that for the most part, the CCW is in compliance with the applicable interim or final WLAs and LAs currently in effect for the Nutrients, OC Pesticides, Toxicity, Salts, and Metals TMDLs. The following observations summarize the compliance status with these load allocations:

- No exceedances of the interim WLAs or LAs for OC Pesticides or PCBs were observed at any location in the watershed.
- Exceedances of numeric targets for Nitrate-N and Nitrate-N + Nitrite-N were observed in Mugu Lagoon, Revolon Slough, Beardsley Wash, Calleguas Creek, Arroyo Las Posas, and Arroyo Simi. Most of the exceedances occurred during dry events. No exceedances of final nutrient WLAs were measured at any POTW compliance site.
- Three exceedances of the final MS4 WLA, but not the interim LA, for chlorpyrifos were measured at receiving water sites during the storm event in 2014. There were no exceedances of the diazinon WLA or LA. No exceedances of the final WLAs for chlorpyrifos or diazinon were recorded at any POTW.
- Exceedances of both the interim LA and final MS4 WLA for total selenium were measured at the 04_WOOD monitoring station in Revolon Slough during the four dry weather sampling events.
- Although toxicity was observed at some locations in the watershed, TIEs were initiated for all samples meeting the requirements in the QAPP. As a result, the Stakeholders are in compliance with the toxicity WLAs and LAs per the requirements of the TMDL.
- In general, receiving water sites were in compliance with interim LAs and MS4 WLAs established by the Salts TMDL; the only exception being exceedances in total dissolved solids, sulfate, and boron measured at 04_WOOD in the Revolon Slough watershed. POTWs are in compliance with interim salts WLAs, with the exception of Camarillo Water Reclamation Plant (WRP), which experienced exceedances of chloride, sulfate, and TDS. The exceedances of interim salts WLAs for the Camarillo WRP have resulted from increased influent salt concentrations due to water conservation and a shift in the composition of the water supplied within the service area. Since the process for addressing salts is a watershed effort involving significant capital investments, the Camarillo WRP has received a time schedule order to adjust the interim limits for TDS and sulfate. During the period of this annual report, application of interim limits for chlorine was stayed by State Board Order 2003-019. As a result, the interim limits in the TMDL are not the currently applicable interim limits for the Camarillo WRP discharge.

Nutrients

Exceedances of numeric targets for Nitrate-N and Nitrate-N + Nitrite-N were observed at sites in Mugu Lagoon, Revolon Slough, Beardsley Wash, Arroyo Las Posas, and Calleguas Creek. Nitrate-N exceedances are summarized in Table 32 below. The table focuses on Nitrate-N

results since Nitrate-N + Nitrite-N exceedances were caused by high Nitrate-N values. Nitrite-N was below the 1 mg/L target at all sites and events.

Table 32. Exceedances of Nitrate-N Numeric TMDL Target of 10 mg/L

Nitrogen TMDL Compliance Sites	Event 39 Aug-2013 Dry	Event 40 Nov-2013 Dry	Event 41 Feb-2014 Dry	Event 43 May-2014 Dry	Event 42 Feb-2014 Wet
01_RR_BR	No	No	**Yes**	**Yes**	No
04_WOOD	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
05_CENTR	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
02_PCH	**Yes**	**Yes**	**Yes**	**Yes**	NR
03_UNIV	No	No	No	No	No
9A_HOWAR	No	No	No	No	NR
9B_ADOLF	No	No	No	No	No
10_GATE	No	No	No	No	No
12_PARK	No	No	No	No	NR
13_BELT	No	No	No	No	NR
06_SOMIS	**Yes**	**Yes**	**Yes**	NS	No
07_HITCH	No	No	No	**Yes**	No
07_MADER	No	No	No	No	No

NR=not required
No signifies that monitoring results were below the Nitrate-N target during the monitoring event.
Yes signifies that monitoring results were above the Nitrate-N target during the monitoring event.

Nitrogen exceedances occurred primarily in areas of the watershed with agricultural inputs. Reaches downstream of POTW discharges are generally in compliance with the TMDL requirements and urban discharges were determined to be negligible during the TMDL analysis and therefore do not have TMDL allocations. The final nitrogen LAs for agriculture became effective in July 2010. The exceedances of the nitrogen LAs since that time have triggered the inclusion of nitrogen in the AWQMP required under the Ag Waiver that is currently being implemented in the CCW. Agricultural education courses have included various classes focused on nitrogen management; AWQMP implementation will continue to target nitrogen and include BMPs to address these exceedances. Compliance with the load allocations is determined through implementation of the AWQMP.

Chlorpyrifos

Further examination of the chlorpyrifos exceedances at receiving water sites was needed to assess whether urban dischargers caused the exceedance of the receiving water allocations. The WLAs for urban dischargers are assessed in the receiving water, while agricultural dischargers are not yet required to be in compliance with the chlorpyrifos final load allocations. Monitoring data at urban land use sites from each subwatershed for which an exceedance was observed was compared to the WLA to determine if MS4 discharges exceeded the allocation during the

monitoring event where elevated receiving water concentrations were observed.[1] If the urban land use data were below the WLA, the MS4 dischargers were considered to be in compliance with the WLAs. If the urban land use data were above the WLA, the MS4 could be contributing to the exceedance in the receiving water.

As shown in Table 33, there were three exceedances of chlorpyrifos targets at the receiving water sites. In all cases, urban land use data for the same event was less than the MS4 WLA for chlorpyrifos. Additionally, for the majority of the events shown in Table 33, chlorpyrifos was not detected at the urban land use sites indicating that it is unlikely MS4 discharges were the cause of the observed exceedances.

Table 33. Compliance and Land Use Sites Comparison to Determine MS4 Chlorpyrifos WLA Compliance

Sites Exceeding WLAs	Constituent	Event 39 Aug-2013 Dry	Event 40 Nov-2013 Dry	Event 41 Feb-2014 Dry	Event 42 Feb-2014 Wet	Event 43 May-2014 Dry
01_RR_BR	Chlorpyrifos				NA [1]	
04_WOOD	Chlorpyrifos				No	
06_SOMIS	Chlorpyrifos				NA [1]	

No= none of the MS4 land use site for the subwatershed exceeded the WLA during the monitoring event.

1. There are no urban land use monitoring sites in these reaches.

Blank cells indicate that a WLA exceedance did not occur at the compliance monitoring site during a particular event.

Selenium

Selenium concentrations in Revolon Slough at 04_WOOD exceeded the urban dischargers interim MS4 WLA and the agricultural dischargers interim LA during all four dry weather monitoring events. A summary of monitoring results for total selenium at sites in the Revolon Slough subwatershed is shown in Table 34 below. For discussion purposes both dry weather and wet weather monitoring results are included in the table.

Table 34. Selenium Monitoring Data (ug/L) in the Revolon Slough Subwatershed

		Dry Weather Events & Dates						Wet Weather Events & Dates	
		Interim		39	40	41	43		42
Site ID	Use	WLA [1]	LA [1]	Aug-13	Nov-13	Feb-14	May-14	Target [2]	Feb-14
04_WOOD	RW	13	6	**17.72**	**17.77**	**20.98**	**20.98**	290	4.31
04D_WOOD	Ag		6	NS	2.46	NS	NS	290	4.05
05D_SANT_VCWPD	Ag		6	**46.51**	**62.6**	**53.03**	**76.56**	290	4.35
04D_VENTURA	Urban	13		ND	0.16	0.25	0.45	290	0.23

1. Interim WLAs for stormwater permittees and interim LAs for agricultural dischargers are effective until March 2022 (R4-2006-012).
2. No wet weather exceedances were observed in the TMDL analysis so no interim limits were assigned for the TMDL. For comparison purposes, the wet weather targets were included in this table.

RW – Receiving water compliance site; Ag – Agricultural; Urban – Urban

NS – Not sampled, dry

Results in **bold type** exceed applicable interim WLA or interim LA.

[1] Refer to Table 5 for a list of land use sites in each subwatershed.

As noted in the table above, high levels of selenium were also observed at 05D_SANT_VCWPD, an agricultural use site in the upper reach of the subwatershed. As discussed in the TMDL, a primary source of selenium in Revolon Slough is considered to be rising groundwater levels and the interim allocations were to be considered in this context.

Salts

TDS and sulfate concentrations in Revolon Slough at 04_WOOD exceeded the urban dischargers' interim MS4 WLA during all twelve months of the monitoring period. Boron concentrations exceeded the urban dischargers' interim MS4 WLA and agricultural dischargers' interim LAs during seven of the twelve months during the monitoring period. In addition, boron concentrations exceeded only the urban dischargers' interim MS4 WLA during the remaining five months of the monitoring period. A summary of monitoring results for total dissolved solids, sulfate, and boron at sites in the Revolon Slough subwatershed are shown in Table 35 through Table 37 below.

Table 35. Total Dissolved Solids Monitoring Data (mg/L) in Revolon Slough

Site ID	Use	Interim Limits		Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14
		WLA	LA												
04_WOOD [1]	RW	1720	3995	**3689**	**3713**	**3858**	**2940**	**3368**	**3392**	**3365**	**3525**	**3628**	**3525**	**3488**	**3767**
04D_WOOD [2]	Ag		3995		NS			1156			NS			NS	
04D_VENTURA [2]	Urban	1720			690			841			757			960	

NS=no sample, dry
1. Data presented are monthly means
2. Data presented are quarterly dry weather grabs
Results in **bold type** exceed applicable interim WLA or interim LA.

Table 36. Sulfate Monitoring Data (mg/L) in Revolon Slough

Site ID	Use	Interim Limits		Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14
		WLA	LA												
04_WOOD [1]	RW	1289	1962	**1850**	**1862**	**1935**	**1475**	**1690**	**1702**	**1688**	**1768**	**1820**	**1768**	**1750**	**1889**
04D_WOOD [2]	Ag		1962		NS			1021			NS			NS	
04D_VENTURA [2]	Urban	1289			220			189			244			263	

NS=no sample, dry
1. Data presented are monthly means
2. Data presented are quarterly dry weather grabs
Results in **bold type** exceed applicable interim WLA or interim LA.

Table 37. Boron Monitoring Data (mg/L) in Revolon Slough

Site ID	Use	Interim Limits		Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14
		WLA	LA												
04_WOOD [1]	RW	1.3	1.8	**1.89**	**1.91**	**1.98**	**1.52**	**1.74**	**1.75**	**1.73**	**1.81**	**1.86**	**1.81**	**1.79**	**1.93**
04D_WOOD [2]	Ag		1.8		NS			1.2			NS			NS	
04D_VENTURA [2]	Urban	1.3			0.24			0.39			0.25			0.41	

NS=no sample, dry
1. Data presented are monthly means
2. Data presented are quarterly dry weather grabs
Results in **bold type** exceed the applicable interim WLA or interim LA

As noted in the previous tables, high levels of total dissolved solids, sulfate, and boron were measured at the 04D_WOOD monitoring site during the November 2013 quarterly event, when flow was present. However, measured concentrations did not exceed the interim agricultural LAs. This site represents agricultural discharge water quality in the Revolon Slough subwatershed. Samples were not taken during the August 2013, February 2014, and May 2014 sampling events due to no flow being present. 04D_VENTURA, which is an urban land use site in the upper Revolon Slough watershed, had concentrations consistently below the interim MS4 WLAs for TDS, sulfate, and boron. The unusually dry conditions in the watershed may be contributing to the higher salts concentrations observed in the receiving waters.

Revisions and Recommendations

The QAPP specifies that during the completion of each CCWTMP annual report, revisions to the standard procedures will be made, including: site relocation, ceasing monitoring efforts and/or deleting certain constituents from sample collection. Some revisions were recommended in the previous annual reports; however no response from the Regional Water Board has been received to date. In order to continue implementing the CCWTMP in an adaptive and cost effective manner, some of the previously requested revisions have been carried out. The following revisions to the QAPP include those previously requested in past annual reports, actions taken, and additional recommendations:

First Year Annual Report Recommendations and Actions

- The relocation of certain CCWTMP land use sites to match new locations of the Ventura County Stormwater Quality Management Program MS4 Stormwater sites, which are monitored by the VCWPD as Principal Permittee under the Ventura County MS4 Permit:
    - The relocations are still being evaluated by the Stakeholders and will be provided to the Regional Water Board as part of the updated QAPP.
- Cease sampling the Nitrogen TMDL investigation sites. These sites were selected to characterize land use discharges to meet a special study requirement in the TMDL. The monitoring was only scheduled to occur for one year[1], so this monitoring has now been completed.
    - Nutrient samples were collected from land use sites through the second year of monitoring, but ceased starting with year three.
    - Nutrient sampling of agricultural land use sites was re-started beginning with event 31 to assess compliance with the Conditional Ag Waiver (Order No. R4-2010-0186) and inform BMP implementation.
- Cease monthly monitoring of metals after the June 2010 monitoring event and return to quarterly for the remainder of the program. This completes one year of monitoring and prevents additional monitoring costs from being incurred while the data evaluation is occurring. Monthly monitoring can be reinitiated, if deemed necessary by the Regional Water Board based on the data review.
    - Monthly metals monitoring ended after the completion of event 21 in June 2010.
- The triazine herbicides atrazine, prometryn, and simazine were included in the monitoring program as they have been detected in toxic samples and have the potential to increase toxicity of OP pesticides.[2] However, triazine herbicides are not on the 303(d) list and have not been identified as contributing to or increasing toxicity in the CCW in

[1] Larry Walker Associates (LWA). 2004. Nonpoint Source Monitoring Workplan for the TMDL for Nitrogen Compounds and Related Effects in Calleguas Creek. July 16, 2004.

[2] Anderson, T. D. and Lydy, M. J. 2002. Increased toxicity to invertebrates associated with a mixture of atrazine and organophosphate insecticides. Environ. Tox. and Chem. V21, No. 7, 1507–1514.

either the historical data or in the recently collected data. As such, conducting analysis for triazine herbicides will be discontinued.

    - Triazine analysis continued through year two and the first two dry weather and first storm event of year three. Triazine sample collection has not been performed since the end of 2010.

- Cease conducting Toxicity Evaluation Investigations (TIEs) at the 04_WOOD site (Revolon Slough at Wood Road crossing) as detailed in the letter sent to the Regional Water Board on July 20, 2009 (Appendix D of CCWTMP First Year Annual Monitoring Report). Toxicity has been observed at this site and as outlined in the letter, the stakeholders would rather invest resources into implementation activities targeting load reductions.

    - TIEs at the 04_WOOD site were not initiated when water quality toxicity was observed during the second, third, fourth, and six years of monitoring. However, the frequency of toxicity has greatly decreased in recent years, with only one occurrence each in years three and four during wet weather and one during year six during dry weather.

Second Year Annual Report Recommendations and Actions

- Cease PCBs monitoring at all land use sites.

    - PCB analysis has continued since there is no cost savings in not obtaining these results.

Third Year Annual Report Recommendations and Actions

- Ending toxicity investigation monitoring. As outlined in the Toxicity Review section of this report, significant mortality has not occurred at either the two water column or two sediment toxicity investigation sites in the three years of the CCWTMP.

    - Although toxicity monitoring has not demonstrated ongoing toxicity at these sites that would warrant continued monitoring, toxicity monitoring was restarted and samples will be collected until sufficient data are available to support a delisting of these reaches.

- Revise the nitrogen TMDL monitoring to reflect a subwatershed approach consistent with the other TMDLs. The nitrogen TMDL was adopted many years before the remaining CCW TMDLs and required a different monitoring approach. Since the compliance deadlines for this TMDL have been reached and many of the TMDL reaches are in compliance, a revised monitoring approach that provides more consistency with the other TMDLs is warranted. Modifications to remove sites for reaches upstream of a subwatershed monitoring location are recommended. These changes are being addressed in the revised QAPP.

Fourth Year Annual Report Recommendations and Actions

- Cease quarterly monitoring in Mugu Lagoon. Metals and general chemistry are the only constituents being monitored during these events, and sufficient data is available to support delisting in the lagoon.

- Quarterly monitoring continues while the Stakeholders are evaluating the overall monitoring program. The revised QAPP will incorporate this change.

Recommended revisions from the first year annual report have been implemented as outlined above. The second year recommendation was not implemented since continuing to report PCB results requires no additional effort. Third and fourth year recommendations are being incorporated into the revised QAPP.

In addition to the recommendations presented above, the QAPP is being updated to incorporate the Salts TMDL monitoring approach. Additional modifications that reflect the most current lab methods and procedures for the field conditions are also part of the QAPP update process. Opportunities to further coordinate the monitoring efforts within the watershed are being investigated.

City of Thousand Oaks
County of Ventura and
Ventura County Watershed Protection District

Malibu Creek Watershed Trash TMDL

TMRP/MFAC Second Annual Report

November 2014

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Introduction

This Annual Report for the second year of Trash Total Maximum Daily Load (TMDL) implementation (2012-2013) is being submitted by the City of Thousand Oaks (the City), County of Ventura (the County), and Ventura County Watershed Protection District (the District) to fulfill compliance requirements for the Amendments to the Water Quality Control Plan – Los Angeles Region for the Malibu Creek Watershed Trash TMDL, Resolution No. R4-2008-007 (effective July 7, 2009). The purpose of this report is to present the 2012-2013 trash monitoring results and to assess compliance with waste load allocations (WLAs) for point and non-point source trash loading. The monitoring efforts that generated the data discussed in this report were conducted according to the TMRP for the Malibu Creek Trash TMDL submitted by the City, the County, and the District to Regional Water Quality Control Board (RWQCB) on April 30, 2010.

This report includes:

- Results from monitoring efforts completed from July 1, 2012 through June 30, 2013 including:
    - A summary of weather events with potential to transport trash and litter, and
    - A summary of trash data for the first year of monitoring.
- Data evaluation:
    - Comparison with 2011-2012 baseline WLAs,
    - Loading source evaluation,
    - Ongoing evaluation of the effectiveness of MFAC/BMP Program, and
    - Determination of compliance with Point Source WLAs and Non-point Source Load Allocations (LAs),
- Proposed modifications to improve BMP effectiveness, and
- Proposed revisions to the TMRP Program.

The components of this program are being supplied through collaboration among the City, the County, and the District, listed responsible parties to the Malibu Creek Watershed Trash TMDL. To complete this effort, the County hired the California Conservation Corps (CCC) to conduct field trash collection efforts and the City provides staff to manage data handling, data evaluation, Best Management Practices (BMP) optimization, and report writing.

Overview

To remedy impairment caused by trash at Lindero and Medea Creeks, the proposed TMRP was devised with representative monitoring locations so that trash accumulation within creek areas could be estimated. The contribution of trash and litter transported by

critical events (high winds and sufficiently intense rainstorms) has been estimated. Therefore, impacts of these events are able to be considered as part of a trash and litter loading evaluation. As specified in the TMRP, a minimum of one collection per month was done at each site. All collections were completed as indicated in Table 1.

Table 1. Collection Date Summary

Monitoring Date	Lindero Creek Reach 2, LC-1	Medea Creek Reach 2, MC-1
7/19/12	X	X
8/29/12	X	X
9/27/12	X	X
10/19/12	X	X
11/26/12	X	X
12/20/12	X	X
1/29/13	X	X
2/14/13	X	X
3/21/13	X	X
4/25/13	X	X
5/30/13	X	X
6/27/13	X	X

Assessment of the first year monitoring data and comparison with the baseline data brought greater insight for 1) refining the prioritization of trash and litter sources for both point source (PS) and non-point source (NPS) trash and 2) providing supplemental Best Management Practice (BMP) options to improve control of both PS and NPS litter. The respective monitoring locations are shown in Figures 1 and 2.

Figure 1. Location Map for Lindero Creek Assessment Site (LC-1)

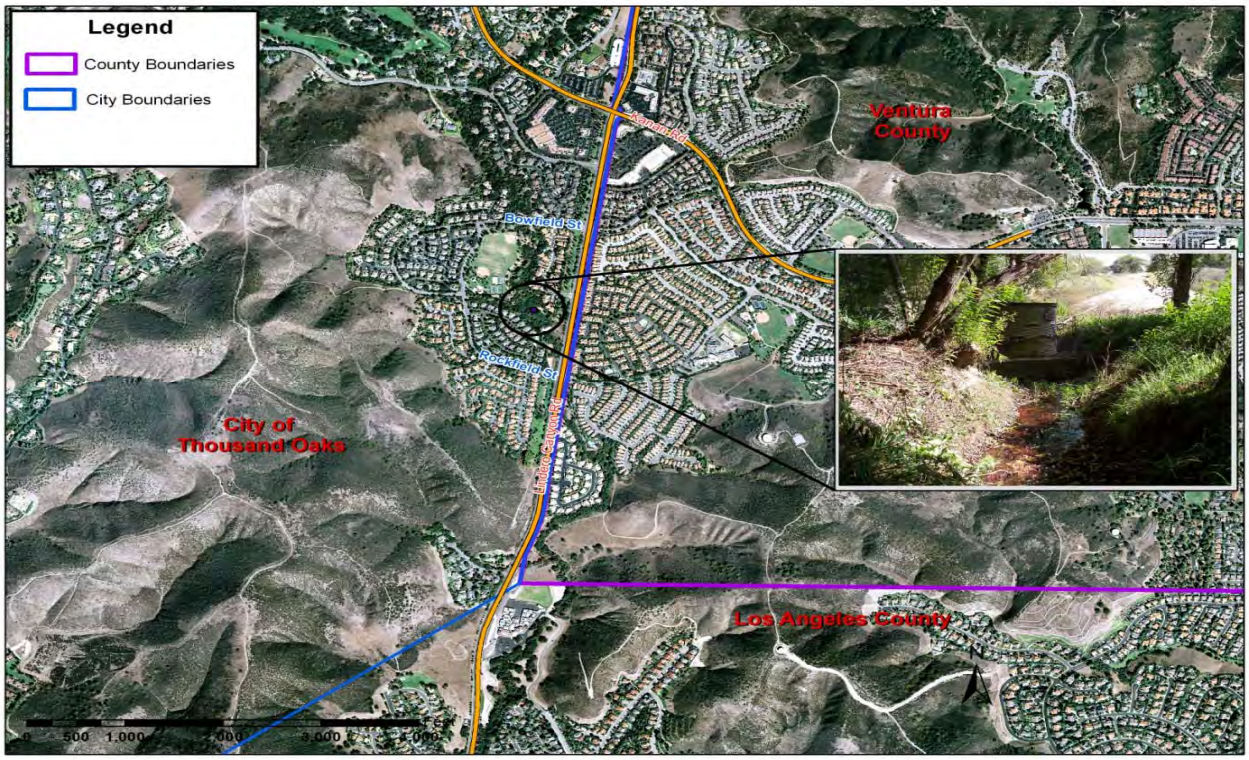


Figure 2. Location Map for Medea Creek Assessment Site (MC-1)

Assessment Area Characteristics

A detailed review of land uses in a drainage area provides another lens with which to identify potential trash sources and activities that affect the movement of trash. For example, commercial areas receive supply deliveries through truck loading operations can be a source of packing material and other litter. In another example, medium density residential areas appear to be more prone to refuse collection as a loading source. Higher density residential areas, in contrast, often use common dumpsters reducing the number of times that individual trash containers need to be lifted up a refuse truck's conveyor. During conveyor operation, trash is susceptible to be blown into the roadway. Spilled trash is not allowed per Waste Hauler contracts, but, in practice, small spills may occur.

Lindero Creek Subwatershed

The area within the City of Thousand Oaks with drainage to Reach 2 of Lindero Creek is 2.08 square miles. A breakdown of land uses in this area is as follows: 49.03% open space, 44.71% residential; 6.25% Public and Institutional Lands (includes a golf course and parks); and 1.29% Commercial. Population is estimated to be 1,970 persons. Areas in unincorporated Ventura County also have drainage to Lindero Creek. This area is 0.9 square miles. The land uses of this area are 9.5% commercial; 49.7% residential; and 40.8% open space. Population data for this area is not available.

The Lindero Creek assessment site is part of a debris basin that receives braided flow that converges at a perforated stand pipe for below flood-stage discharges that bypass the overflow structure. The reduction in hydraulic gradient at the debris basin, in addition to the standpipe's size restriction, promotes trash and debris accumulation in the flood plain after storm-level flows recede.

Medea Creek Subwatershed

The area within unincorporated Ventura County (Oak Park) with drainage to Reach 2 of Medea Creek is 3.32 square miles. A breakdown of land uses is as follows: 6.93% commercial and community facilities; 30.08% residential; and 62.98% open space. A population estimate has not been calculated yet.

Medea Creek as it flows through the assessment area follows a single, defined path. When flow levels rise due to a storm event, the stream configuration causes bank overflow and deposition of transported trash and debris into an existing flood plain.

Monthly and Yearly Trash Comparisons

Comparison of monthly piece counts helps identify temporal patterns such as increases due to seasonal usage or isolated incidents that cause a spike in trash levels. Figures 3 and 4 show the monthly levels of trash and litter collected for each of the metrics:

Figure 3. Lindero Creek Monthly Loading

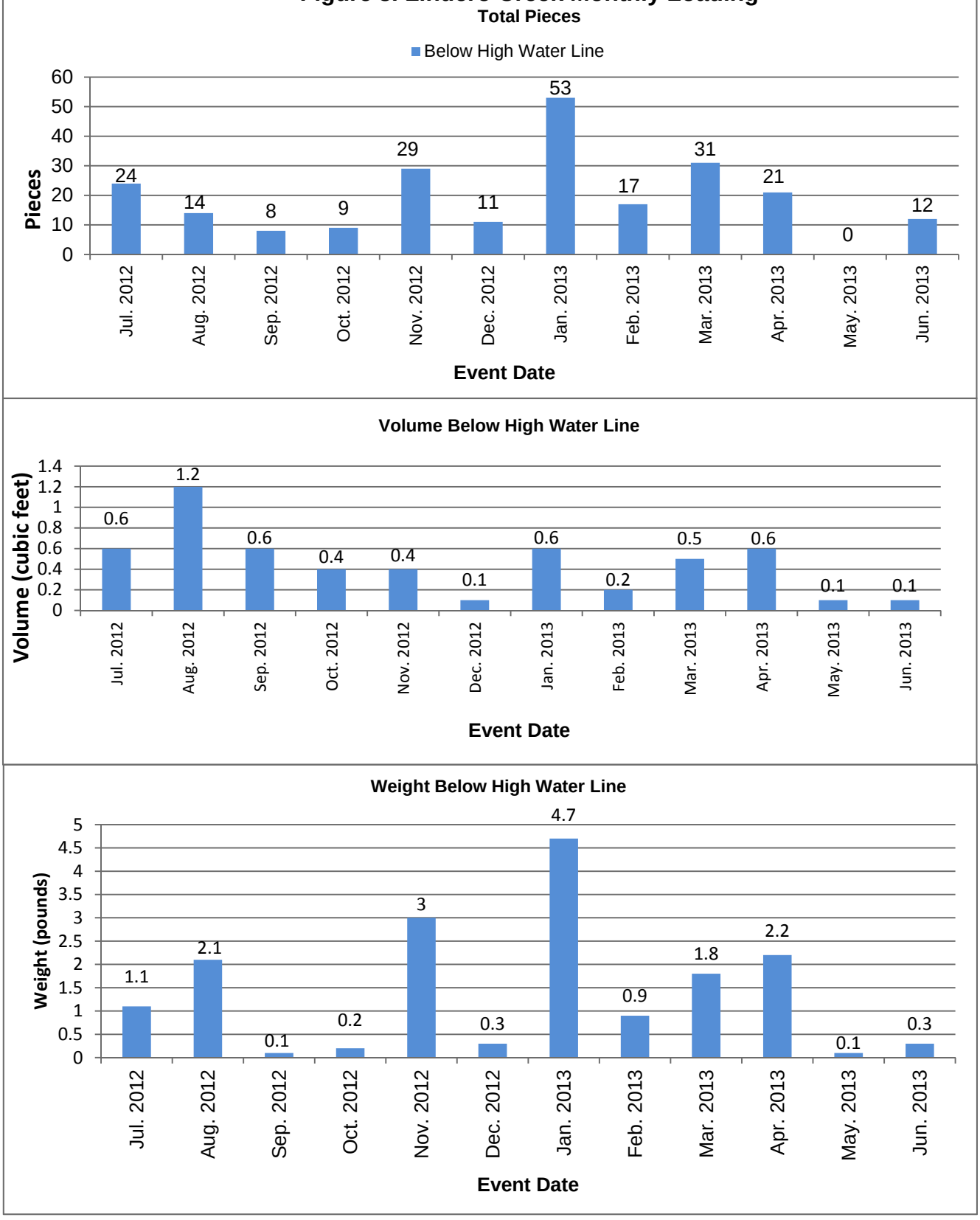
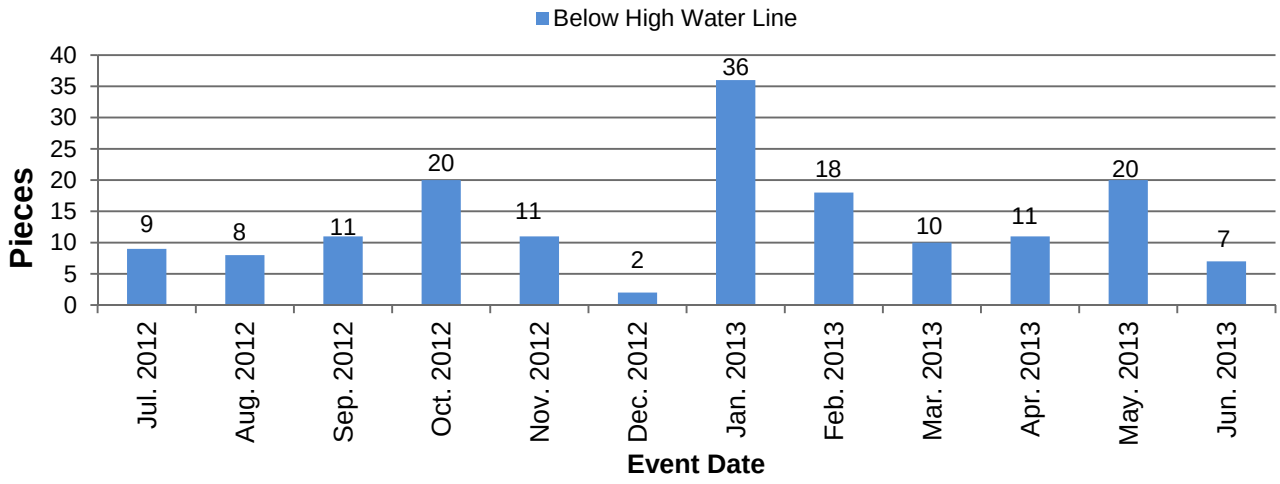
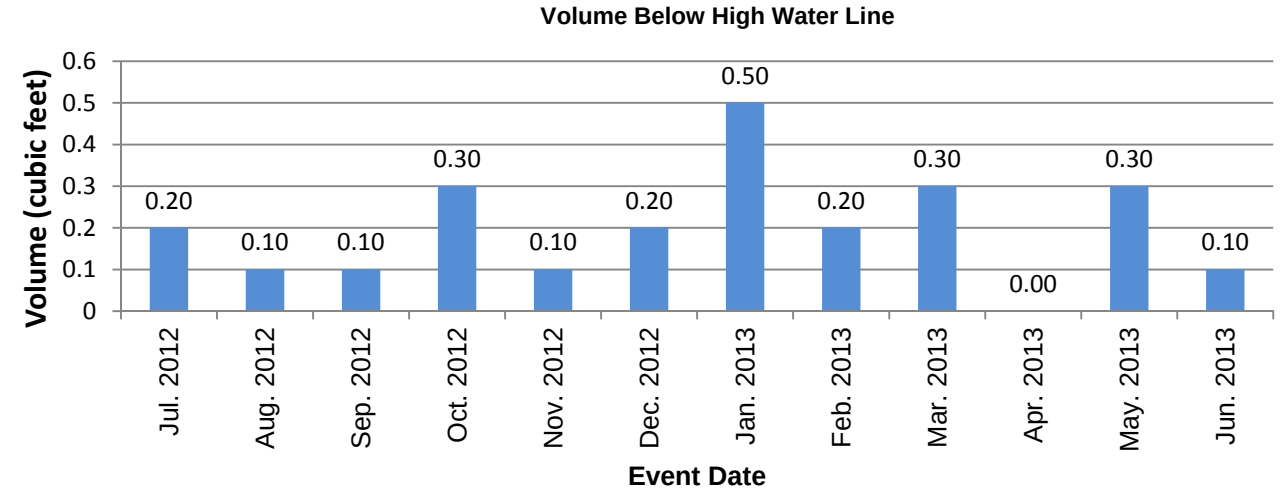


Figure 4. Medea Creek Monthly loading





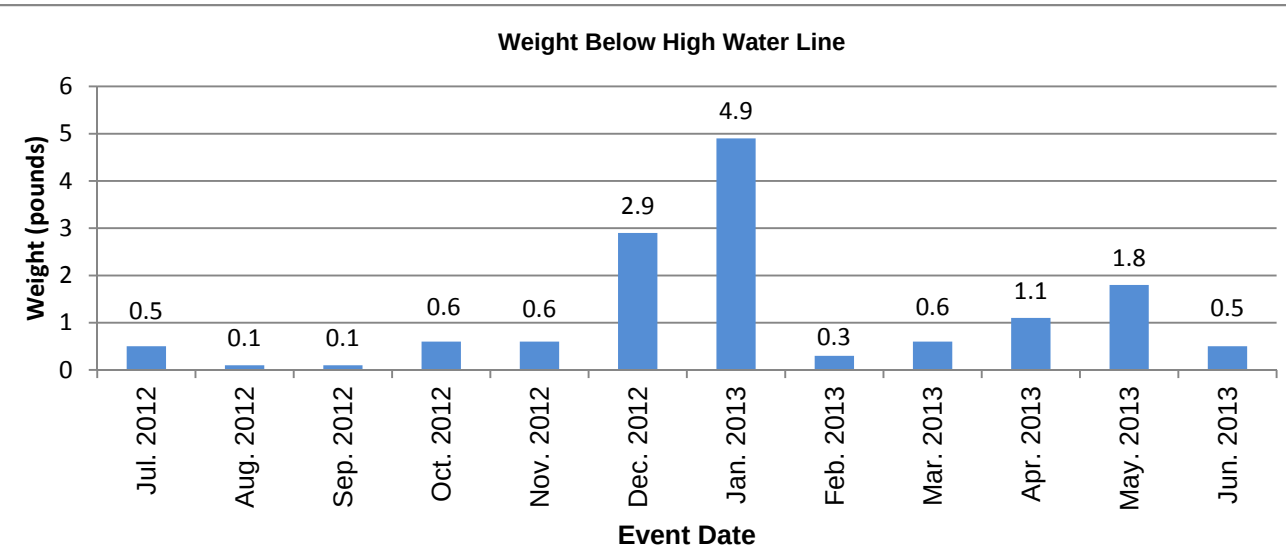


Table 2 shows that there were substantial reductions in litter pieces for most of the monthly collections at both Lindero and Medea Creek assessment sites. The average monthly piece counts at both the sites were reduced from the Baseline year to the first year of implementation by more than 70%. This greatly exceeds the required WLA reduction of 20% by July 7, 2013.

Table 2. Lindero and Medea Creek Monthly Pieces

Date	Lindero Creek		Medea Creek	
	2011-12 Baseline	2012-13 Year 1	2011-12 Baseline	2012-13 Year 1
7/19/12	94	24	44	9
8/29/12	125	14	130	8
9/27/12	43	8	88	11
10/19/12	69	9	270	20
11/26/12	245	29	299	11
12/20/12	16	11	12	2
1/29/13	0	53	5	36
2/14/13	24	17	15	18
3/21/13	15	31	0	10
4/25/13	112	21	34	11
5/30/13	91	0	28	20
6/27/13	36	12	21	7
Average	73	19	79	14
Ave. % Reduction	74		82	

Trash Category Comparison

Reviewing the category to which individual pieces of trash and debris belong is another method to gain information about loading trends. During monitoring year No. 1 (2012-13), the magnitude of trash in most categories was substantially reduced compared to the baseline year monitoring (2011-12). At Lindero Creek, there is significant reduction in all categories, averaging 70% (see Table 3).

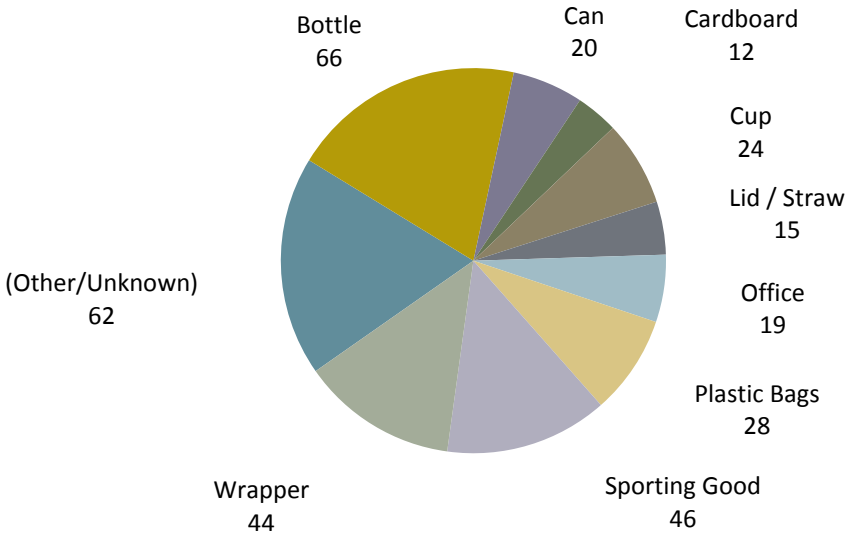
Table 3. Percent Category Change Lindero Creek

Category	2011-12 Baseline	2012-13 Year 1	% Reduction
Lid/Straw	32	15	53
Cans	86	20	77
Plastic Bags	62	28	55
Bottle Caps	18	4	78
Other/Unknown	400	62	85
Wrapper	124	44	65

Category (Continued)	2011-12 Baseline	2012-13 Year 1	% Reduction
Shattered Glass	16	0	100
Sporting Goods	142	46	68
Plastic Bottle	125	66	47
Cups	72	24	67
Food Container	17	5	71
Average % Reduction			70

The relative contributions from trash categories at the reduced levels found in year 1 are shown in the pie-chart in Figure 5.

Figure 5. Lindero Creek Trash Composition (pieces)



The trash categories that are still accumulating in sizable amounts are Plastic Bottles, Other/Unknown, Sporting Goods, Wrappers, Plastic Bags, and cups. The recurring presence of these litter types is understandable given their utility and availability. There was also a continued presence of sports equipment such as tennis and golf balls.

Similar to Lindero Creek, reductions in most trash categories occurred in year 1 at Medea Creek (see Table 4). The average piece reduction in the categories was 70%.

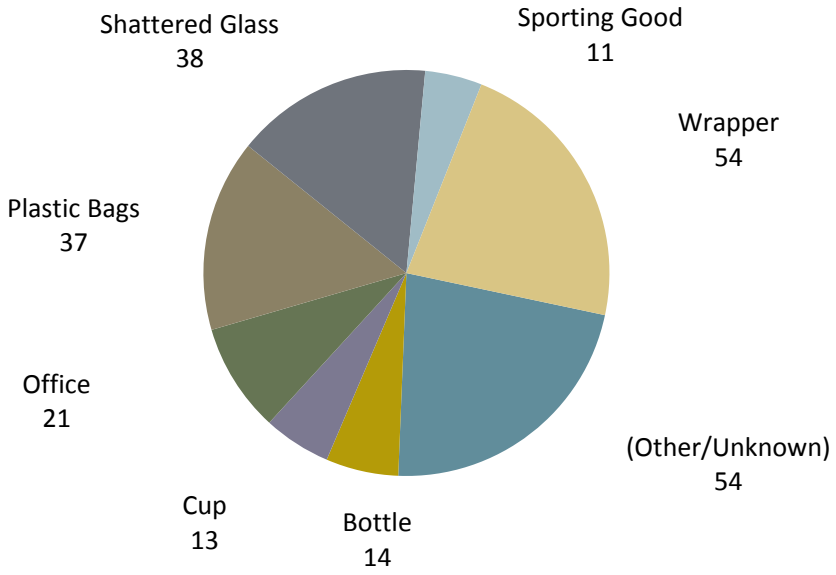
Table 4. Percent Category Change Medea Creek

Category	2011-12 Baseline	2012-13 Year 1	% Reduction
Lid/straw	18	5	72
Cigarettes	38	4	89

Category (Continued)	2011-12 Baseline	2012-13 Year 1	**% Reduction**
Cans	21	5	76
Plastic Bags	37	37	0
Bottle Caps	18	5	72
Other/Unknown	577	54	91
Wrapper	132	54	59
Shattered Glass	520	38	93
Sporting Good	19	11	42
Ammo	343	5	99
Average % Reduction			70

The relative contributions of each of trash categories at this location are shown in the pie chart (Figure 6).

Figure 6. Medea Creek Trash Composition (pieces)



The categories of litter that are still occurring at the Medea Creek site again are those more commonly used and available items. In this case, they were Wrappers, Shattered Glass, and Plastic Bags. Wrappers implicate children as a likely source: Wrappers are often from candy. Broken glass continued to be impacted by random vandalism where one careless act can cause a significant impact. The Other/Unknown composite category is also still prominent. The Factors causing its presence were yet unknown. Undiminished Plastic Bag litter at this site may be related to higher recreational use due to easily accessed trails. Secondly, there is a greater amount of medium-density housing in close proximity to the assessment area. As discussed, there is greater likelihood of increased trash spillage associated with this land use.

Analysis of Trash Loading

Looking at trash loading in all three metrics simultaneously is to view how a site and its circumstances can favor certain patterns of accumulation. For example, weight and volume metrics can correlate well with piece counts. When they do not, this may indicate particular circumstances such as a lower intensity weather event with the inability to transport heavier materials.

More than one peak increases the likelihood that excessive loading occurred. To help assess the cause of loading impacts revealed in such a way, the data sheets were reviewed for information. Possible source are discussed along with the pattern of simultaneous peaks in multiple metrics presented in Tables 5 and 6. Note that a peak (alternatively, spike) is defined as a level that exceeds the monthly average for the year by 20% or greater. Note that, more credence was given to piece count and weight metrics. This is because of the difficulty in uniformly packing litter materials to eliminate spaces in the measuring container. At the Lindero Creek assessment area, spikes co-occurred in two or more metrics shown by month in Table 5:

Table 5. Lindero Creek Multiple Peaks

Site	**Month**						
Lindero Creek	**Jul.**	**Aug.**	**Sept.**	**Nov.**	**Jan.**	**Mar.**	**Apr.**
Piece Count Peak	Y	N	N	Y	Y	Y	N
Volume Peak	Y	Y	Y	N	Y	N	Y
Weight Peak	N	Y	N	Y	Y	Y	Y

July—Pieces and Volume: A larger amount of heavier items such as soft drink cans and bottles accumulated due to increased outdoor presence in summer.

November—Pieces and Weight: Many of the collected materials were from the sports equipment category with components that tend to be higher in weight.

March—Pieces and Weight: Again, a large amount of errant sports equipment (assorted balls) added both weight and numbers to trash loading.

August—Weight and Volume: There was an obvious impact caused by the youngsters who made a cement overflow structure next to the assessment area the locus of their recreation. A handsaw, pair of shorts, and spray-paint can were among the materials collected that is suggestive of their presence.

April—Weight and Volume: This month was another instance where a number of lost tennis balls contributed to a spike in weight. Cardboard pieces may account for the increased volume.

January—Pieces, Weight, and Volume: Spikes occurred across all metrics indicating maximal loading. The recurring presence of lost or discarded sports equipment is a factor especially for increased weight. Added to this, there were

over a dozen drink cans and plastic bottles and numerous air-gun ammos that contributed to piece count.

At the Medea Creek assessment area spikes co-occurred in two or more metrics as shown by month in Table 6:

Table 6. Medea Creek Multiple Peaks

Site	Month		
Medea Creek	**Oct.**	**Jan.**	**May**
Piece Count Peak	Y	Y	Y
Volume Peak	Y	Y	N
Weight Peak	N	Y	Y

October—Piece and Volume: The pieces came from a variety of categories with no recognizable pattern except for frequent contribution from sports equipment. Volume may have been read artificially high, due to water bottles.

January—Piece, Weight, and Volume: Peaks occurred in all metrics indicative of a maximal loading. The appearance of trash categories seemed to be random. The high volume was likely influenced by not compressing the several plastic bags that were collected.

May—Piece and Weight: A high number of candy wrappers accounted for 40% of the pieces. Six wet paper bags artificially influenced weight due to water content.

Critical Events Loading

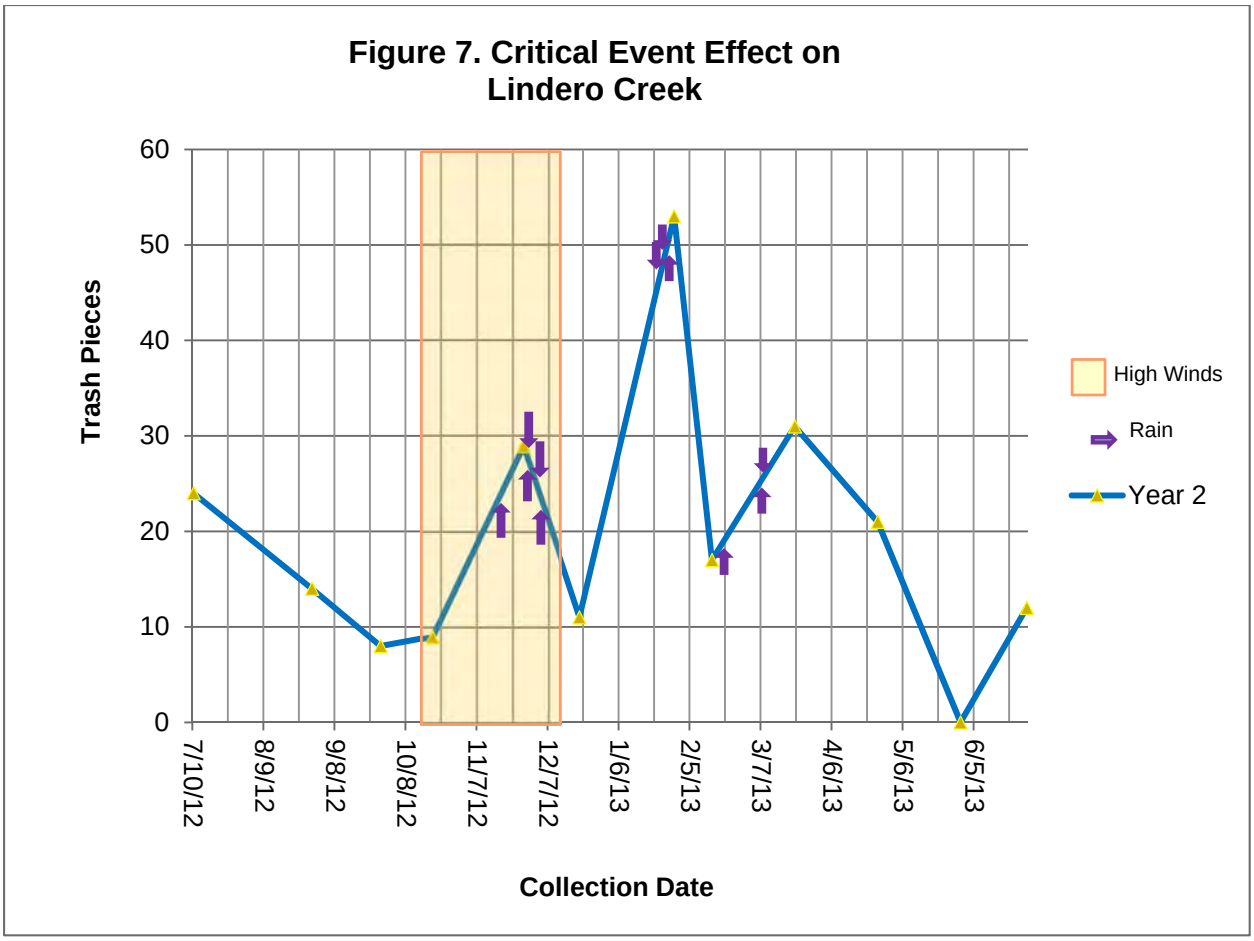
A drier weather pattern is occurring in the Lindero Creek and Medea Creek subwatersheds. The original intent to judge trash loading impacts from critical rain events with precipitation ≥ 0.7” has been modified. Now, any storm ≥ 0.10” is evaluated to facilitate the collection of critical event transport data. Loading can then be compared to a monthly average to help determine if transported litter is caused by weather conditions. Depending on how close litter is to a creek or how light weight it is a smaller storm could impact loading. Therefore, this relaxation is deemed valuable. Table 7 summarizes the significant weather events.

Table 7. Critical High Wind and Significant Rain Events

Wind Events		Wind Events		Rain	Wind Events		Rain
Date	Speed, mph	Date	Speed, mph	Volume >0.10”	Date	Speed, mph	Volume >0.10”
10/13/12	44	11/1/12	46		12/2/12		0.20
10/14/12	49	11/2/12	45		12/3/12		0.27
10/15/12	47	11/3/12	45		12/5/12	44	
10/16/12	47	11/4/12	46		12/6/12	43	
10/17/12	47	11/5/12	44		12/7/12	44	
10/18/12	46	11/7/12	45		12/8/12	47	
10/19/12	46	11/10/12	49		12/9/12	42	
10/22/12	43	11/11/12	47		12/10/12	44	
10/23/12	47	11/14/12	44		12/11/12	44	
10/24/12	47	11/17/12		0.25	1/23/13		0.50
10/25/12	47	11/20/12	42		1/25/13		0.33
10/26/12	46	11/22/12	43		1/26/13		0.20
10/27/12	46	11/23/12	43		2/19/13		0.21
10/28/12	44	11/26/12	42		3/7/13		0.21
10/29/12	46	11/27/12	42		3/8/13		0.35
10/30/12	46	11/29/12		0.16			
10/31/12	47	11/30/12		0.20			

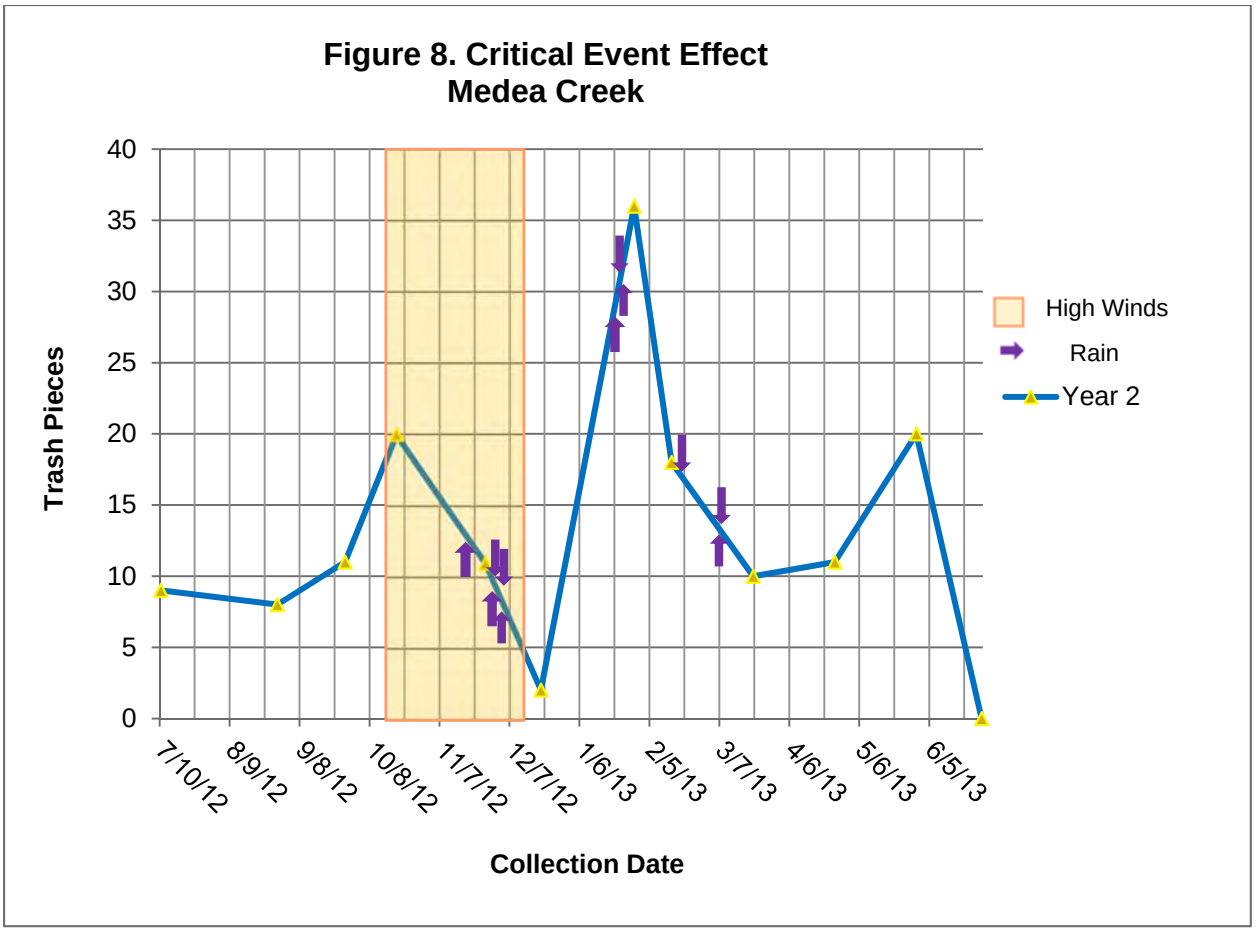
To better assess a significant weather event’s impact on site trash loading, significant and critical wind and rain event dates were superimposed on a line graph of the monthly piece counts for each assessment site. Data points represent collection dates.

At Lindero Creek, the most conspicuous detail regarding piece counts and critical or significant weather events was that each peak count was preceded by high winds and/ or a significant rain event (see Figure 7). This could be coincidental, but more likely it is an illustration of high wind and rains’ ability to transport trash and debris. Further evidence suggesting that rain transport causes an increase in loading is that the largest peak in trash pieces occurs after the highest intensity rain events.



The additive effect of wind and rains caused increased loading as evidenced in November's piece count peak. Being the first storm of the season, a greater relative amount of trash might have been expected. Alternatively, the forces related to the magnitudes of these smaller storms may have been inadequate to dislodge trash and move it through the system. This hypothesis gains additional strength considering that the largest peak occurred after the most intense rain event (January).

The Medea Creek assessment area, in contrast to the Lindero Creek site, does not consistently show a piece count increase in response to significant or critical weather events (Figure 8).



The high wind period and first rains, for example, coincide with a decreasing trend in total pieces. The trio of storms in January, however, does prove adequate to cause an increase in trash pieces (20 vs. average of 14). This storm favored the movement of light-weight pieces or there were more of them available. Smaller tandem rain events in March 2013 were insufficient at causing a loading peak for the month. These storms may have lacked adequate motive force.

Trash and Debris Loading

The amount of litter collected at the assessment sites each month is summarized in Table 8. Annual totals are included so these values can be compared to the PS WLAs in effect at each site.

Table 8. Trash Loading at Lindero Creek and Medea Creek

Date	Medea Creek (MC1)			Lindero Creek (LC1)		
	Count pieces	**Vol., cf**	**Weight lbs.**	**Count pieces**	**Vol., cf**	**Weight lbs.**
7/19/12	9	0.2	0.5	24	0.6	1.1
8/29/12	8	0.1	0.1	14	1.2	2.1
9/27/12	11	0.1	0.1	8	0.6	0.1
10/19/12	20	0.3	0.1	9	0.4	0.2
11/26/12	11	0.3	0.6	29	0.4	3
12/20/12	2	0.3	2.9	11	0.1	0.3
1/29/13	36	0.5	0.3	53	0.6	4.7
2/14/13	18	0.5	0.3	17	0.2	0.9
3/21/13	10	0.6	0.6	31	0.5	1.8
4/25/13	11	0.04	1.1	21	0.6	2.2
5/30/13	20	0.6	1.8	0	0	0
6/27/13	7	0.2	0.2	12	0.1	0.3
Annual Total	**163**	**3.7**	**8.6**	**229**	**5.4**	**16.8**

Point Source Compliance

As stated in the Trash TMDL, in order to comply with the Trash Reduction Implementation Schedule, a 20% reduction of trash from Baseline WLA is required by July 7th 2013. The Baseline WLA was submitted with the Malibu Creek Trash TMDL Baseline and Annual Report on 7/31/13 and is shown in Table 9. Point source compliance for trash was achieved in all metrics at both assessment sites.

Table 9. WLA Versus Trash Loading

Data Type	Lindero Creek			Medea Creek		
	Pieces	Vol. (cf)	Weight (lbs)	Pieces	Vol.(cf)	Weight (lbs)
Baseline WLA	902	13.4	69	970	7.2	16.3
Required 20% Reduction	722	10.7	55.2	776	5.8	13.0
1st Year Annual Loading	229	5.4	16.8	163	3.7	8.6

Non-Point Source Compliance

This was a year of field survey and option evaluation with regard to controlling NPS trash. The logistics of conducting volunteer cleanups have been piloted at 2 events at Lindero Creek (Appendix 1) and an Oak Park community event called Big Sunday on May 5, 2013 (Appendix 5). Another volunteer trash collection event at Medea Creek had to be cancelled due to insufficient attendance. Since then, support groups and calling trees have been established for the Medea Creek subwatershed. At the collection events, adjoining areas at each assessment site were cleaned of all trash to meet zero trash requirements for non-point sources.

Trash Sources Discussion

Lindero Creek Subwatershed

Recreation is a sizeable component of individual and family activities in the Lindero Creek subwatershed. Accordingly, the many recreational facilities available at the 12-acre North Ranch Playfield are well used. It has tennis courts, jungle gyms, and areas for baseball and soccer. The playfield is situated about ¼-mile upstream of the LC-1 assessment area. Lost or discarded balls from tennis, golf, softball, and soccer cause a noticeable increase in debris loading at the assessment site. The Park Director has been amenable to installing signage at the park to raise awareness of those participating in recreational activities. Signs requesting tennis players refrain from casting away no longer usable balls are planned. Other signage has been installed as discussed in the section on “BMP Modifications.”

Areas surrounding and including the Lindero Creek assessment site are owned by Westlake Ranch Property Owners Association. As a result, many creek areas are semi-private. The Conejo Open Space Conservancy Agency (COSCA) maintains a narrow, undeveloped trail next to the creek with minimal signage at the trailheads. These factors appear to lead to a lesser amount of recreational hiking along Lindero Creek.

Despite the trail’s lack of amenities, youth have adopted a spill-way structure immediately adjacent to the Lindero Creek assessment area for cycling and skate board use. Their presence is the likely source of graffiti, as well as scattered litter and debris. Because these areas are privately owned and not easily patrolled, the City has limited ability to suppress such vandalism.

During a field survey, it was discovered that one of the commercial areas in the subwatershed has a catch basin with drainage to the LC-1 assessment area. Packing material and food container litter were also seen in this lot. These materials are likely broken into fragments by vehicular traffic. Debris fragments created in this way may be a

source contributing to the largest category of trash at LC-1, Other/Unknown (refer to Figure 5).

Medea Creek Subwatershed

Similar to Thousand Oaks, there is significant recreational activity in the Medea Creek subwatershed. In contrast to Lindero Creek, trails here are accessible and clearly indicated by signs. Trail improvements include paved pathways, dog bag stations, and trash receptacles. Park areas are maintained by the Rancho Simi Recreation and Park District. The result of better access and close proximity to a high school may be factors increasing the frequency of random vandalism including bottle breakage.

An analysis of land use types was done to determine the potential sources of trash to Medea Creek. No commercial land uses were found in the vicinity of the Medea Creek assessment area in unincorporated Ventura County. Medea Creek receives a trickle overflow from a duck pond fed by runoff and base flow. Due to adequate maintenance and low flow, this pond poses minimal risk of contributing trash to Medea Creek. There are four schools in this subwatershed. Of these schools, field reconnaissance revealed that Oak Park High School (OPHS) was a contributor of litter. This school also has sports fields and tennis courts.

Existing BMPs

The BMPs currently in use in areas surrounding and including assessment sites LC-1 and MC-1 are itemized as follows:

City of Thousand Oaks

- Catch basin cleaning - Catch basins are inspected annually. If trash has accumulated to 25% or more of the unit's capacity, it is cleaned by a vactor truck.

- Street sweeping - all residential areas (public and private) are swept 19 times per year and commercial areas are swept once per week.

- Open channel storm drain maintenance: All city-maintained channels are inspected and cleaned as required once per year prior to the wet season.

- Public Event - A recycling plan is required when obtaining a permit for staging public events. This plan requires adequate facilities for trash collection and disposal and reclamation of recyclable materials.

- Public areas - Trash receptacles have been placed at public use areas. These devices are monitored and emptied regularly.

- Freeway Ramp and Interchange Collection Program - The City pays for trash and debris collection at freeway on-ramps and exits and from the freeway interchange.

- Free Landfill Day - The City sponsors two days one in April and one in September when residents may take waste and recyclables, including electronics, to the Simi Valley Landfill for free disposal.

- The City-sponsored "Neighborhood Cleanup Program" provides 40-yard dumpsters and free disposal to residential neighborhoods desiring to organize and conduct cleanup events.

- Residents may safely and legally dispose of household hazardous waste at the City's monthly collection events. In addition, the City provides household battery collection services at twelve locations.

- Thousand Oaks residents may dispose of up to four "bulky items" per year, such as appliances, mattresses and old furniture, simply by calling their trash company and arranging for free pickup.

- Thousand Oaks Municipal Code Sec.7-8.201 (7) prohibits the disposal and accumulation of trash in public and private areas.

- Catch basins are labeled "Drains to Creek, Do Not Dump" or "Drains to Lake, Do Not Dump."

- Public outreach/education addressing trash pollution is conducted at multiple public events, through radio and newspapers ads, and on the City's website.

- Utility bill inserts - Promotional inserts are used to advertise for Coastal Clean-up Day, Community Clean-up Day, Free Landfill Day, and other City-sponsored trash reduction/clean-up programs.

County of Ventura and VCWPD Litter Management Program:

- On July 31, 2012 the County of Ventura Board of Supervisors received and filed a draft model Single-Use Bag Ordinance referred to the County by the Beach Erosion Authority for Clean Oceans and Nourishment (BEACON). The County endorsed the use of up to $8,000 as the County's pro-rata share of a regional Environmental Impact Report (EIR) to be prepared by BEACON, which is required to be completed under the California Environmental Quality Act (CEQA) before the model single-use bag ban can be adopted. This is the first step for the County to move forward with the consideration of adoption of a single-use plastic bag ban.
- Catch basin cleaning - Catch basins are inspected at least once a year and cleaned when filled to 25% or more of the catch basin's capacity. During storm season, all drainage facilities are inspected and cleaned as necessary.
- Ventura County's catch basins are labeled, "Don't Pollute, Flows to Waterways."
- Open channel storm drain maintenance - All channels owned and maintained by VCWPD are cleared, inspected, and cleaned as required at least once per year.
- Trash Management at Public Events - A proper management of trash and litter plan is required when obtaining a permit for staging public events. This plan requires adequate facilities for trash collection and disposal.
- Public areas - Trash receptacles have been placed within high trash generation areas. These devices are cleaned and maintained regularly to prevent trash overflow.
- Residents of Thousand Oaks, Oak Park, bell Canyon, Lake Sherwood, and unincorporated areas can dispose of household hazardous waste & electronic waste for free as offered by the City of Thousand Oaks Program each 1st Saturday of the month except for December.
- The amended Ventura County Stormwater Quality Management Ordinance for Unincorporated Areas (Ventura County Ordinance No. 4450) has been in effect since August 2012. It includes litter and trash specific prohibitions (§ 6942) of the discharge or deposition of trash that may enter the County storm drain system or receiving waters. The revised ordinance also includes increased civil penalties for violations and provisions for issuing administrative fines, recovery of costs, and misdemeanor violations.
- The County and VCWPD continue to participate in the Countywide Stormwater Program to provide outreach and education retaining the services of "The Agency", a professional advertisement group that designs and conducts Countywide, bilingual outreach programs advocating proper trash disposal. The most recent

addition to the outreach program is trash prevention and protection of stormwater quality education using Facebook®.

- The County conducts commercial, industrial, and construction facility/site inspections to ensure proper pollutant prevention BMPs are being applied and to educate the employees on the importance of pollution prevention.

BMP Modifications

There are steps that could be done to further reduce trash loading in the subwatersheds. For example, some of the trash categories found in high numbers in the assessment areas e.g., Wrappers (candy) and Plastic Ammo suggest that children were a source. To lessen such contribution, educational messaging should be provided to nearby schools describing the harmful effects of litter in an aquatic habitat.

New BMP measures were employed to mitigate trash loading from the suspected sources and existing accumulations of non-point source trash.

Lindero Creek

- Two volunteer cleanups were done to remove non-point source trash which has the potential to be transported into the creek (Appendix 1).

    1. May 4, 2013—ten volunteers removed an estimated 80 pounds of trash and debris.
    2. September 7, 2013—twenty one volunteers removed 92 pounds of trash and debris (weighed).

- A Shopping center owner was asked to install a full-capture device to prevent trash discharge to the creek (see Appendix 2).

- A sign was added that advertises the presence of Malibu Creek Watershed at the North Ranch Playfields to heighten awareness of valuable water resources. The sign explicitly asks the viewer to “Keep it Clean” (Appendix 3).

Medea Creek

Non-point source accumulation field surveys were done in subwatershed areas outside of the assessment site to pinpoint sources of trash loading. BMP were added at priority locations with others being planned.

- A sign was added next to Oak Park High School that encourages the protection of Malibu Creek Watershed and its water resources with the reminder message to “Keep it Clean” (Appendix 3).

- A free “Ocean Friendly Gardens” class was offered to the public on 6/15/13. Reduced runoff lessens transport of trash and debris (see Appendix 4).

- Plans are underway with support from the Oak Park High School Principal as well as neighborhood groups to begin NPS trash removal this spring.

TMRP Modifications

The trigger to evaluate a Critical Rain Event for its transport effect is changed from one delivering 0.7” of precipitation in 24-hours to any storm producing 0.1“ or more of precipitation in 24-hours. This modification will provide more data points given the drier meteorological conditions now found in the related areas. Additionally, the change will help discern an increase in loading from rain transport of litter that is near, but not in the flow zone (above high-water line).

Appendix 1: Pilot Volunteer Cleanups at Lindero Creek

Appendix 2: Shopping Center BMP Request

City of Thousand Oaks

Public Works Department

2100 Thousand Oaks Boulevard • Thousand Oaks, CA 91362
Phone 805/449-2400 • Fax 805/449-2499 • www.toaks.org

February 11, 2014

Jay T. Spurgin
Public Works Director

Ms. Carla Martin, Site manager
Gerity Group
977 Lomas Santa Fe Dr.
Solana Beach, CA 92075

Dear Ms. Martin:

This letter is follow-up to my initial phone call from November 20, 2013, regarding the discharge of trash from the shopping center complex (including 1165 Lindero Canyon Road) into the storm drain system owned and operated by the City of Thousand Oaks (the City). As Manager acting on behalf of the property owner, Island Pacific Management, you put me in contact with Paul Weiss. I met Mr. Weiss at the site on December 4, 2013. I showed him how active littering in the parking area, as well as its grade, and the configuration and grating of the catch basin were each conducive to trash being transmitted into the City's storm drain system.

The location of this stormwater inlet is of particular concern, because discharge from that site flows to a designated trash assessment area. The City has been ordered to meet rigorous water quality standards that are judged at this assessment area for trash. I mentioned to Mr. Weiss that the best option of which I am aware to restrict the flow of trash debris from a catch basin down to 5mm is to have a perforated screen mounted over the outflow pipe (called a connector pipe screen). Though I cannot claim that the companies I have contacted provide the best service at the least cost, I have a couple of price quotes that you can use either as a reference or a source:

Company	Contact	Email	Phone	Total Cost
StormTek	Octavio	octavio@stormtekcps.com	714-457-3283	$1,289.00
United Stormwater	Terry Flury	terry@unitedstormwater.com	887-717-8676	$497.00

I appreciate your helping the City to maintain its stormwater system requirements. If I can provide further information, please call me at 805-449-2386 or email me at rmanwill@toaks.org.

Sincerely,

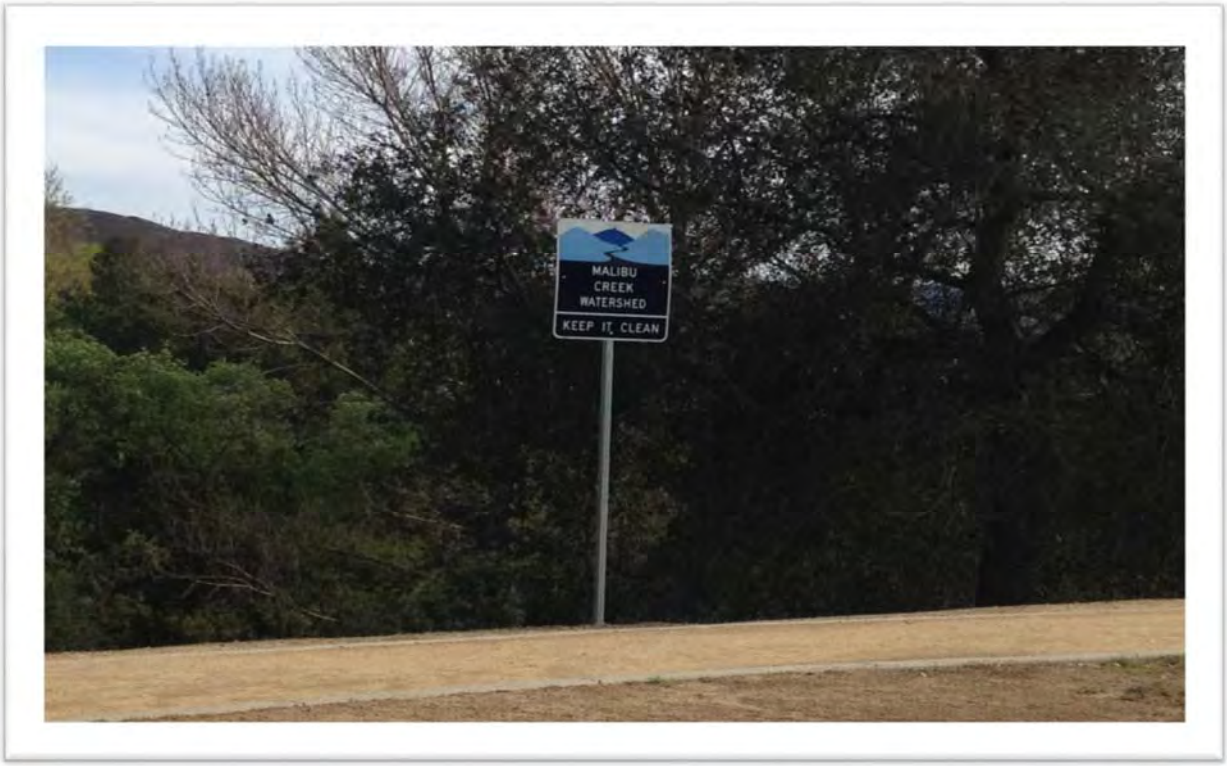
Ron Manwill
Environmental Programs Analyst

c: Felicia Serra
Paul Weiss

DPW:530-25:mjas\Fins\Manwill\MCW Trash TMDL 1165 Lindero Cyn Rd.docx

toaks.org

Appendix 3: Signage BMP



Appendix 4: Ocean Friendly Gardens Class

Ocean Friendly Gardens™ Class

Reduce Urban Runoff Pollution + Conserve Water

OCEAN FRIENDLY GARDENS™

When: Saturday, October 26, 2013 • 9:00 a.m. to 12:00 noon

Where: Oak Park Community Center, 1000 Kanan Rd. in Oak Park

Sign Up Today! It's

FREE

Space is Limited!

Call Now!

818-889-8996

Registration Deadline October 23

Attend this interactive, action-packed class taught by a Green Gardens Group landscape designer and learn to develop an

Ocean Friendly Garden™

- Install permeable surfaces and on-site water retaining systems
- Use native, water-wise plants
- Understand water-efficient irrigation devices

Use Surfrider Foundation's Principles of CPR© (Conservation • Permeability • Retention) to transform your thirsty landscape into an ocean friendly asset that saves time and money, helps prevent beach and ocean pollution, and creates wildlife habitat.

TRIUNFO SANITATION DISTRICT

Watershed Protection District VENTURA COUNTY

City of Thousand Oaks

SURFRIDER FOUNDATION VENTURA COUNTY CHAPTER

Questions? Call 818-889-8996 or email opwater@triunfosanitation.com


EXIT


EXIT


Ocean Friendly
Gardens Class
Welcome!

Appendix 5: Oak Park Community Big Sunday Event

The Acorn
Serving Agoura Hills, Calabasas, Oak Park and Westlake Village

Big Sunday, a day of giving

By Stephanie Bertholdo
sbertholdo@theacorn.com

Hundreds of students, teachers, moms, dads and business owners are planning to volunteer their time on Big Sunday to help make their community— and communities beyond their borders—a better place to live.

Big Sunday is a statewide volunteer event during which people offer aid to nonprofits, schools and other agencies that need help.

Oak Park Unified School District has partnered with the Community Outreach Committee to organize volunteers to participate in Big Sunday on May 5. Last year more than 300 people offered their time and services.

Big Sunday committee chair, Toni Caruso, said this year's volunteer force is even bigger. So far, nearly 500 people have pledged to provide a half-day of work.

The national Big Sunday event is a day of serving the community through volunteering and a "little elbow grease," Caruso said.

Volunteers of all ages and abilities have a host of projects to choose from. At local schools, new trees will be planted, and planters at all Oak Park schools will be cleaned and filled with new flowers and other plants.

Parking and loading zones at schools and on streets will painted; storm drains will be cleared to keep pollution from making its way to creeks and the ocean, and litter will be cleared from hiking trails.

Pavers at Medea Creek Middle School will be repaired; the copy room at Brookside Elementary School is being painted, and a new shed is being built in the kindergarten area. Every school in the district has a project that needs completing, Caruso said.

Altogether, the Big Sunday committee plans to complete 37 projects.

Caruso said one dad from Agoura Hills has already fixed a gate for an Oak Park senior who couldn't handle the job on her own.

The Rancho Simi Recreation and Park District requested that volunteers pick up trash on three trails in Oak Park. Park representatives will be on hand to collect all the filled bags, Caruso said.

Ventura County officials asked that Big Sunday volunteers focus on storm drains that funnel water, branches and other debris to the ocean. County representatives said that people often think the drains are the perfect place to dump motor oil and other pollutants. Big Sunday volunteers will paint the drains with a message: "Don't dump, drains to creek."

"We need little hands to do weeding, medium hands to do cleaning, larger hands to do painting and professional hands to handle more difficult jobs," Caruso said.

Numerous sponsors have contributed money and supplies to the Big Sunday effort.

Caruso said $4,200 has been raised to defer costs of equipment. Greg Epstein, owner of Enhanced Landscape in Thousand Oaks, donated about 200 trees and plants to the cause.

The Big Sunday gang has also partnered with clubs at Oak Park High to collect donations for a variety of charities. Items can be brought to the event or dropped off at any school site from May 2 to 3.

Caruso named the charities and their needs:

* Surf Club: Canned food for Ventura Country Rescue Mission.

* Grossman Burn Center Club: New socks—adult and child sizes.

* Key Club: New or used books for Oak Park Library.

* Red Cross Club: New or gently used pillow cases.

* National Honor Society: School supplies and DVDs for Support for the Kids.

* Students for Protection of Animals and Environment: Pet products—toys, leashes, adjustable collars—Science Diet dog food and cat food, PetSmart gift cards.

* Freshman and sophomore soccer teams: New or gently used soccer items—shoes, shirts, shin guards, balls.

Monetary donations are being collected for the Ventura County Rescue Mission, Red Cross, American Cancer Society, the Oak Park Foundation, Make-AWish Foundation and others.

The day will begin around 8 a.m. with breakfast, a group photo and registration at the high school. Projects begin at 9 a.m. Caruso said she anticipates all projects will be completed no later than noon.

For further information on volunteering from 8:30 a.m. to 12:30 p.m. on Big Sunday, May 5, visit www.oakparkusd.org/communityoutreach or email community@oakparkusd.org.

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